

On the collections of Indo-Australian Spirobolida (Diplopoda) kept in the Zoological Museum of the Moscow State University, Russia. 3. Some Rhinocricidae

О коллекциях индо-австралийских Spirobolida (Diplopoda), хранящихся в Зоологическом музее Московского государственного университета (Россия). 3. Некоторые Rhinocricidae

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КЛЮЧЕВЫЕ СЛОВА: двупарноногие многоножки, таксономия, иконография, Новая Гвинея, Фиджи, Соломоновы острова.

ABSTRACT. Most of the material of the family Rhinocricidae, the largest in the entire order Spirobolida and very common and diverse in Australasia, is treated, being represented in the collections of the Moscow Museum from the southwestern Pacific by at least seven species in four genera: *Propodobolus*, *Dinematocricus*, *Eurhinocricus*, and *Salpidobolus*. All these species are described and illustrated, but most of their identifications are only provisional because rhinocricid taxonomy is still generally chaotic, especially confused in the region we consider here. The genus *Eurhinocricus* is new to the fauna of Fiji. Lectotype designation is made for *E. saipanus* Verhoeff, 1937 from Saipan (= Guam), Marianas, Micronesia.

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РЕЗЮМЕ. Обработано большинство материала по семейству Rhinocricidae, самому крупному во всем отряде Spirobolida и очень обычному и разнообразному в Австралии. Оно представлено в коллекциях одного лишь московского музея из юго-восточной части Тихого океана по крайней мере семью видами из четырех родов: *Propodobolus*, *Dinematocricus*, *Eurhinocricus* и *Salpidobolus*. Все эти виды описаны и снабжены иллюстрациями, но большинство из них определены лишь предварительно, потому что таксономия семейства хаотична вообще и особенно запутана в данном районе в

частности. Род *Eurhinocricus* — новый для фауны Фиджи. Для вида *E. saipanus* Verhoeff, 1937 с острова Сайпан (= Гуам) (Марианские острова, Микронезия) выделен лектотип.

Introduction

This is the third contribution to the fauna of the millipede order Spirobolida of the southwestern Pacific based on the collections of the Zoological Museum of the Moscow State University (ZMUM), Russia. This time it treats most of the material belonging to the very large family Rhinocricidae. Our previous contributions dealt with some old or new Pachybolidae and Spirobolellidae from New Guinea and Australia [Golovatch *et al.*, 2020a, b].

Most of the ZMUM samples were taken in 1976 and 1977 by Yuriy I. Chernov and Galina F. Kurcheva during two expeditions on board the research vessels “Kallisto” and “Dmitry Mendeleyev”, respectively, to several islands and archipelagos in the southwestern Pacific. A few additional samples were very generously donated to the ZMUM collections by Dmitry Telnov, Riga, Latvia.

Considering the global catalogue by Marek *et al.* [2003] and several subsequent relevant papers [González-Sponga, 2005; Rodrigues *et al.*, 2012, 2020; Shelley, 2014; Golovatch, 2014], the family Rhinocricidae presently comprises 543 nominal species and 23 subspecies placed in 27 genera and three subgenera. The family is the largest in Spirobolida and shows two major distribution areas: one in the Americas where its

species range from northern Argentina (but absent from Chile!) in the south to the Caribbean and northern Mexico in the north. The second area is in the southwestern Pacific, including almost entire Indonesia, the Philippines, New Guinea, Micronesia, Melanesia, and eastern Australia [Marek *et al.*, 2003]. The catalogue of the Indo-Pacific Spirobolida by Jeekel [2001] is still fully relevant as regards Rhinocricidae.

Pitz *et al.* [2010], using both morphological and molecular evidence, recovered the suborder Rhinocricidea and its sole constituent family Rhinocricidae as monophyletic, and sister to the remaining suborders Trigoniulidea and Spirobolidea. The family is characterized by 2+2 supralabral setae, a weak lateral groove at the anterodorsal margin of the collum, the anterior gonopod sternite a large triangular plate without lateral extensions, with each coxite forming a slight groove to conceal/support, albeit without wrapping, a simple, thin, largely flagelliform, elongate, and often bifurcated posterior gonopod. In addition, species of the family Rhinocricidae are among the spirobolids that show scobinae, a peculiar pair of paramedian pits at the front margin of prozonae.

Only two of the seven Rhinocricidae species documented below could be securely identified because too many taxa remain inadequately known [Jeekel, 2001]. Of 170+ species or subspecies from nine formal rhinocricid genera hitherto reported from Australasia, about half are completely dubious. Even the generic assignments of numerous taxa are often provisional, and several names are invalid [Jeekel, 2001]. Against this background, we are inclined to follow a cautious approach and refrain from definite species identifications. Instead we offer perhaps the first adequate iconography of southwestern Pacific Rhinocricidae to depict and describe the ZMUM collections in proper detail, as a first step towards understanding the diversity and taxonomy of this group. Only this approach could seriously clarify much of the still prevailing taxonomic mess in the family and order [Golovatch *et al.*, 2020a, b].

Material and methods

All new material treated below is deposited in the ZMUM. Colour pictures were obtained with a Canon EOS 5D digital camera and stacked using Zerene Stacker software. Type material housed in the Museum of Natural History, Vienna (Naturhistorisches Museum in Wien, NHMW) is partly revised and documented for comparison with the material in the ZMUM. NHMW types were illustrated using a Nikon DS-Ri-2 camera mounted on a Nikon SMZ25 stereo microscope using NIS-Elements Microscope Imaging Software with an Extended Depth of Focus (EDF) patch.

Some original labels have been edited a little to add detail and read better.

The classification, however deficient, follows that of Jeekel [2001] and Minelli [2015], allowing for catalogue sections to largely be omitted as redundant.

Taxonomic part

Family Rhinocricidae Genus *Propodobolus* Silvestri, 1897

Type species: *Rhinocricus quintiporus* Attems, 1897, by original designation.

COMMENT. This is a relatively small genus of Rhinocricidae currently comprising only nine species or subspecies from New Guinea and several surrounding archipelagos (Moluccas, Bismarck and Solomons) [Jeekel, 2001]. Following Jeekel [2001], we consider the species with only four apical cones on each antenna (= tetraconocerate), a strong to hypertrophied sternum of the anterior gonopods devoid of a basally constricted central process, coupled with a simple and bifurcate posterior gonopod only terminally broadened into an obliquely truncate blade, as belonging to this genus.

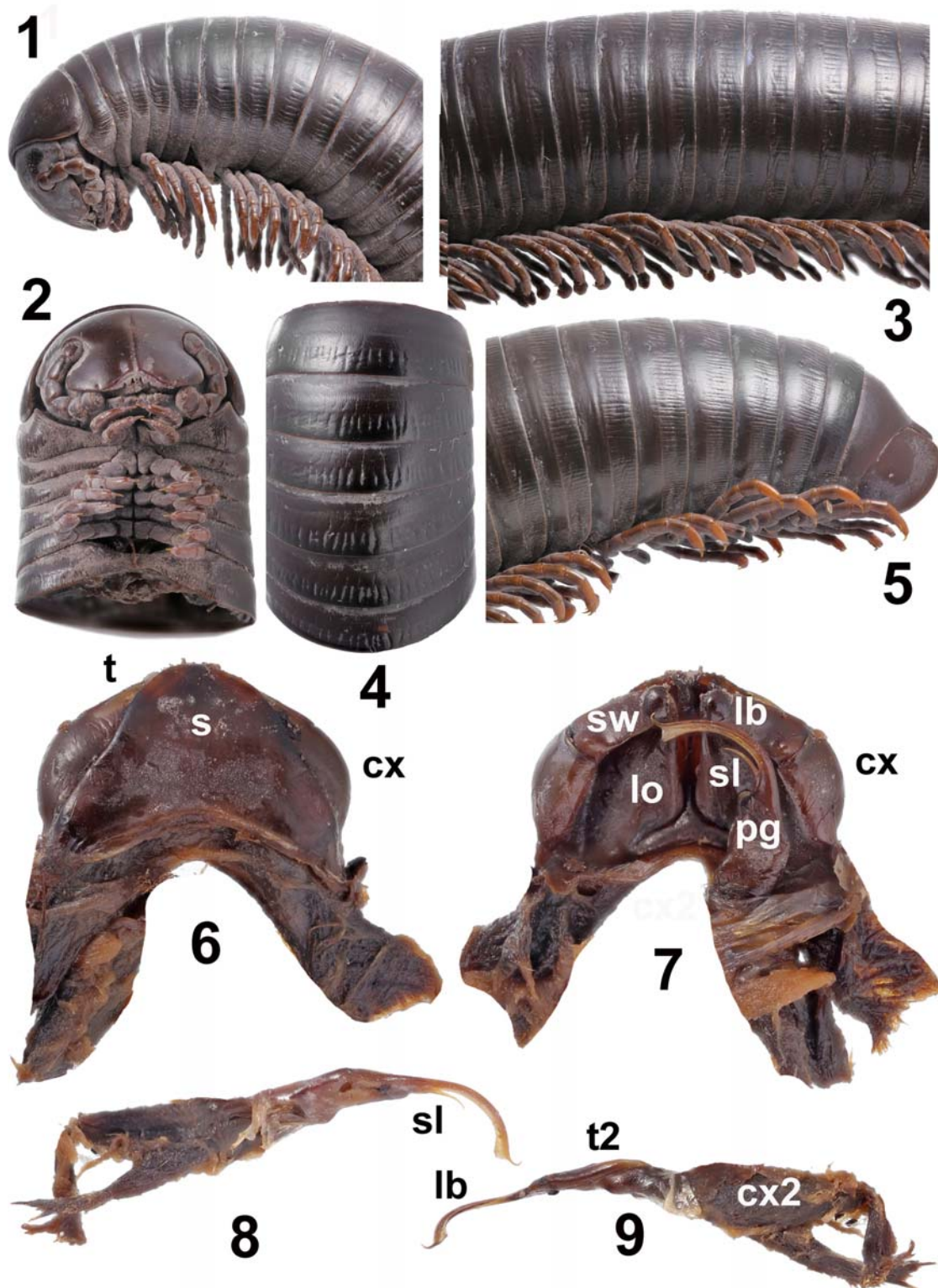
Propodobolus sp.

Figs 1–9.

MATERIAL. 2 ♂♂, 2 ♀♀ (ZMUM), Indonesia, West Papua Province, Onin Peninsula, 5–7 km N of Fak-Fak, S2°53', E132°18', 300–400 m a.s.l., primary lowland tropical rainforest on limestone, 25.IX.2010, D. Telnov leg.

DESCRIPTION. Body ca. 170–185 mm long, width or height of midbody segments 14–15 mm (♂, ♀), with 54p+1ap+T (♀) or 56p+T (♂, ♀) segments. Colouration uniformly blackish to black-brown, antennae, legs, gonopods and telson dark red-brown, clypeus usually red (Figs 1–9). Mesozonae often mottled with small light spots, apparently these being sigilla translucent from beneath.

Body cylindrical, postcollum constriction very faint (Fig. 2). Head as usual, bare, with three small, but evident, central teeth at fore margin of, and a short, axial and distinct suture on, labrum, followed by a superficial, fine, axial, epicranial line, with ca. 7–8+7–8 labral and 2+2 supralabral setae. Eye patches suboval, large and blackish (Fig. 1), each composed of ca. 23–25 flat ommatidia arranged in 5–6 vertical rows (e.g., ca. 5+5+5+4+3+2); interantennal isthmus ca. 2.5x diameter of eye patch (Fig. 2). Antennae short and clavate, curved anteroventrad, *in situ* stretchable laterally behind until caudal margin of collum; in length, antennomere 2 > 3 > 4=5=6 > 1 > 7; antennomeres 5–7 clothed with particularly dense, but mostly short setae; 8th with four small apical cones (Figs 1, 2). Tegument bare, almost smooth, very finely leathery, mostly shining (Figs 1–5). Collum broadly rounded and clearly bordered only anteriorly, sulcus being rather short; caudolateral surface very delicately, densely, longitudinally and irregularly striolate (Fig. 1). Segment/ring 2 with a conspicuously flattened and subvertically striolate anteroventral part to subtend collum. Midbody segments/rings devoid of evident sutures between zonae, very poorly constricted and sometimes even slightly rugulose only between meso- and metazonae; dorsum bare until ring 7 or 8, following metazonae and, later, mesozonae sparsely, irregularly, mostly finely and longitudinally striate/striolate dorsally, striations often being rather vague and abbreviated both caudally and anteriorly, mostly being deeper on metazonae; mesozonae remaining smooth from about ozopore level down to a particularly densely, obliquely and irregularly striolate ventrolateral third, while metazonae striate across entire circumference, but increasingly clearly, more densely and regularly so ventrolaterally; prozonae particularly densely, con-



Figs 1–9. *Propodobolus* sp., ♂ from Onin Peninsula. 1, 2 — anterior part of body, lateral and ventral views, respectively; 3 — middle part of body, lateral view; 4 — body segments 8–13, dorsal view; 5 — caudal part of body, lateral view; 6, 7 — anterior gonopods and left posterior gonopod, anterior and posterior views, respectively; 8, 9 — right posterior gonopod, anterior and posterior views, respectively. Designations explained in text. Pictures by K.V. Makarov, taken not to scale.

Рис. 1–9. *Propodobolus* sp., ♂ с полуострова Онин. 1, 2 — передняя часть тела, соответственно сбоку и снизу; 3 — средняя часть тела, сбоку; 4 — туловищные сегменты 8–13, сверху; 5 — задняя часть тела, сбоку; 6, 7 — передние гоноподы и левый задний гонопод, соответственно спереди и сзади; 8, 9 — правый задний гонопод, соответственно спереди и сзади. Объяснения обозначений в тексте. Фотографии К.В. Макарова, сняты без масштаба.

fusedly and vertically striolate (Figs 1–5). Scobinae absent. Ozopores small and round disks lying at fore margin of metazonae on all leg-bearing segments starting with segment 6 (Figs 1, 3, 5). Telson (Fig. 5) as usual, epiproct flat, small, digitiform, clearly concave dorsally at base, rounded caudally; paraprocts very strongly and regularly convex, smooth, clearly bordered into prominent caudal lips with a conspicuous gutter between both valves; hypoproct nearly semi-circular, transverse, rounded caudally. Only ♂ segment 7 clearly swollen ventrally, a complete ring due to a strong ventral bridge in caudal half (Figs 1, 2). No visible sigilla on internal surface of meso- and metazonae.

Legs short and slender, ca. 2/3 as long as midbody height, each usually with a spine above and below claw, ventral spine being more clearly removed from claw; only ♂ legs 1 and 2 somewhat shorter and devoid of ventral sole pads on tarsi, while most following tarsi until those in ♂ caudal body third with evident sole pads; ♂ coxae 3–5 clearly expanded ventrally, rounded tubercles being more evident on coxae 3, but lower on coxae 5 (Fig. 2).

Gonopods strongly sclerotized (Figs 6–9). Anterior gonopods with an unusually prominent, high and semi-circular sternum (**s**) devoid of a median process, **s** being slightly higher than telopodites (**t**); the latter slender, each with a bulbous apical swelling (**sw**) on caudal face, only slightly longer than a stout coxa (**cx**) with its prominent, mesal, subtriangular process/lobe (**lo**); both lobes almost meeting at midline. Posterior gonopods (**pg**) connected with a simple, membranous, ribbon-shaped sternum, each gonopod consisting of a short subcylindrical coxa (**cx2**) and a slender, longer, bipartite telopodite (**t2**); apicolateral branch (**lb**) the largest, clearly curved, apically expanded into a small and obliquely truncate blade with a short, curved, apicolateral, flagelloid spike; mesal branch (= solenomere, **sl**) much shorter, flagelliform, originating just at base of **t2**.

REMARKS. This species readily resembles the particularly similar *Propodobolus adipatus* (Karsch, 1881) and *P. beauforti* (Attems, 1914), both nicely described and illustrated by Attems [1915] from Waigeo Island (formerly Waigeu), Raja Ampat Islands, Indonesia, and both showing rather irregular and vague striations on the metazonae, as well as hypertrophied and apically rounded sterna of the anterior gonopods. However, our species differs by the slightly higher sternum and apically non-pilose telopodites of the anterior gonopods. Moreover, *P. adipatus* and *P. beauforti* are so close both morphologically and geographically that they may well prove to represent different adult ♂ developmental stadia of a single species. Gradual changes in gonopodal structure have long been shown in the hemianamorphosis of Rhinocricidae [Mauriès, 1980; Enghoff *et al.*, 1993; Bond *et al.*, 2003]. So we are inclined instead to leave our sample unidentified closer.

In *Propodobolus quintiporus* (Attems, 1897) (the type species of the genus), *P. compactilis* (Attems, 1897), *P. fulvescens* (Carl, 1918), *P. pachyskeles* (Attems, 1897), and *P. xanthopygus* (Attems, 1897), all from the Moluccas, Indonesia [Attems, 1897; Carl, 1918], the anterior gonopod sternum is somewhat lower, sometimes bilobed apically, and the telopodites are clearly drawn apart either side of the midline.

The western, currently Indonesian part of New Guinea alone is also known to support a bunch of dubious rhinocricids formally belonging to several genera, all of which Jeekel [2001] listed among Rhinocricidae, Spirobolida or even Juliformia of uncertain status. Two particularly enigmatic spe-

cies, “*Julus*” *roissyi* Leguillou, 1841 and “*Julus*” *doreyanus* Gervais, 1847, come from New Guinea, the former taxon totally without a locality. Only the name of the latter species may represent a hint at Port Dorey, harbour of Manokwari, Doberai Peninsula, Indonesia.

In addition, “*Rhinocricus*” *dimissus* Silvestri, 1895 was described from “Andai”. As all historic museum collections of the time also stem from near the settlement of Manokwari, S0°55', E134°01', the geographic provenance of that species seems to be clear. Likely the same concerns “*Julus*” *roissyi* as well. “*Rhinocricus*” *granti* Hirst, 1914 is known from near Mimika River, E136°30', S4°30', south of Mount Puncak Jaya, the highest peak of New Guinea, rather close to the town of Timika, Indonesia. “*Dinematocricus*” *exul* Chamberlin, 1920 is from “Djamna”, the old name of Jamna Island, S2°01', E139°15', off the northern coast of New Guinea, between Sarimi and Javapura, Indonesia.

“*Dinematocricus*” *fratellus* Chamberlin, 1920 and “*D.*” *permundus* Chamberlin, 1920, are both from Manokwari again, the capital city of West Papua Province of Indonesia. Although no identified rhinocricid seems to have ever been recorded from the Onin Peninsula, because the risk of falling in synonymy seems to us too high, we refrain from labeling our Papuan *Propodobolus* species before at least some of the available type material of old dubious taxa becomes revised, and an iconography published. This would allow us to properly compare the types to our description and illustrations.

Propodobolus spp. share virtually the same, highly characteristic structure of the posterior gonopod not only with the genus *Australocricus* Jeekel, 2001, with seven species from eastern Australia [Jeekel, 2001], but also with some *Eurhinocricus* forms from the Antilles [Bond, Sierwald, 2002]. As this is likely to be evidence of a convergent evolution of that structure, the main distinction between the former two genera, both Australasian, remains the absence of a marked/high, basally constricted, central process on the anterior gonopod sternum in *Propodobolus*, vs. its presence in *Australocricus*.

Genus *Dinematocricus* Brölemann, 1913

Type species: *D. lanceolatus* Brölemann, 1913, by original designation.

COMMENT. This is one of the largest genera in Rhinocricidae currently comprising at least 44 nominal species or subspecies [Jeekel, 2001]. Following Jeekel [2001], we consider the species with only four apical cones on each antenna (= tetraconocerate), coupled with a simple, bifurcate and flagelliform posterior gonopod, as belonging to this genus. Contrary to Jeekel [2001], Hoffman [1974] considered it as a junior subjective synonym of *Salpidobolus* Silvestri, 1897 (see below).

Dinematocricus aff. *bionus* Chamberlin, 1920 Figs 10–31.

Dinematocricus bionus Chamberlin, 1920: 195, original description from the ♀ holotype from Bio Island, Solomon Islands.

“*Dinematocricus*” *bionus* — Jeekel, 2001: 39.

MATERIAL. 1 ♂, 3 ♀♀ fragments (ZMUM), Solomon Islands, Isabel Province, Bio Island, S7°31'49.3", E158°41'0.1", on litter surface, 23.XII.1977, Yu.I. Chernov leg.

DESCRIPTION. The only complete specimen (♂) ca. 85 mm long, 11.5 mm wide, with 32p+T segments. ♀ fragments up to 11.5–12.0 mm wide. Colouration rather uni-



Figs 10–14. *Dinematocricus* aff. *bionus* Chamberlin, 1920, larger ♂ from Bio Island. 10, 11 — anterior part of body, lateral and ventral views, respectively; 12 — middle part of body, dorsal view; 13 — midbody segment enlarged to show scobinae, dorsal view; 14 — caudal part of body, lateral view. Pictures by K.V. Makarov, taken not to scale.

Рис. 10–14. *Dinematocricus* aff. *bionus* Chamberlin, 1920, более крупный ♂ с острова Био. 10, 11 — передняя часть тела, соответственно сбоку и снизу; 12 — средняя часть тела, сверху; 13 — увеличенный среднетеловый сегмент со скобинами, сверху; 14 — задняя часть тела, сбоку. Фотографии К.В. Макарова, сняты без масштаба.

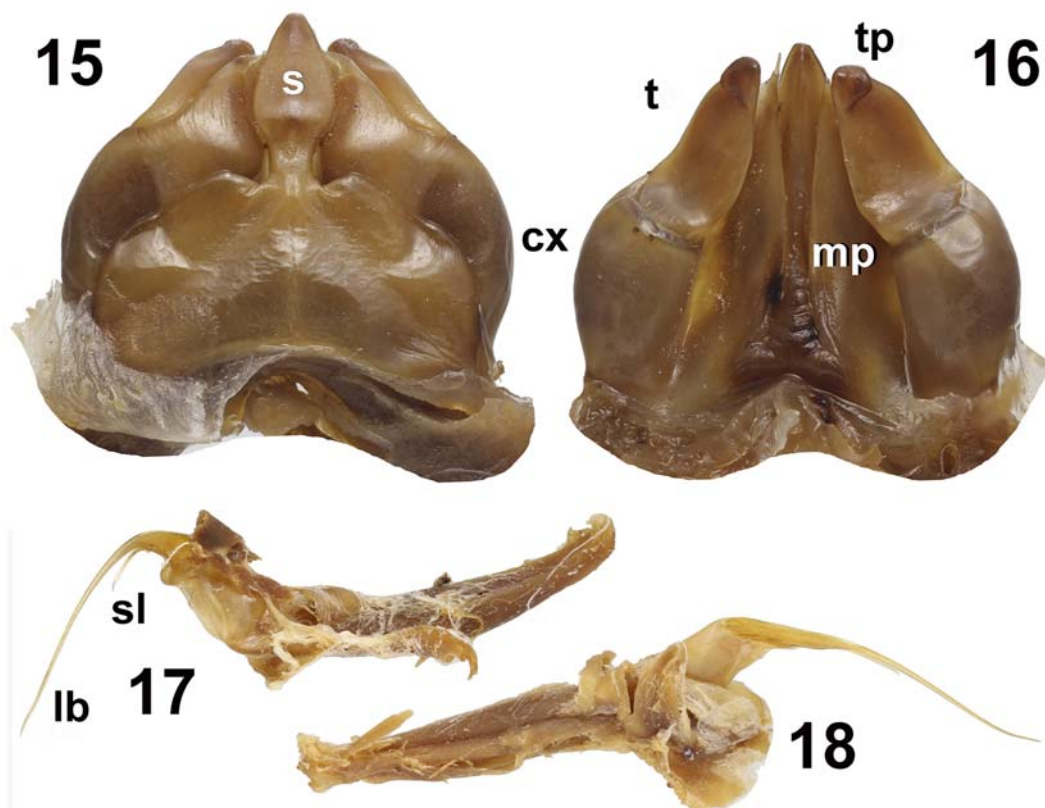
formly dark grey- to black-brown, mostly deep olive, only labrum and prozonae red-brown, legs grey- to reddish brown, and eye patches blackish (Figs 10–14).

All characters as in *Propodobolus* sp., except as follows.

Tegument smooth, finely leathery, mesozonae mostly shining, metazonae almost dull. Interantennal isthmus ca. 2x diameter of antennal socket. Collum broadly and regularly rounded laterally, anterior, lateral and even caudolateral margins clearly, but narrowly bordered. Midbody segments/rings very faintly striolate, apparently strongly obliterate, more densely and clearly so ventrad, dorsum fully smooth; striolations on metazonae longitudinal and visible only in ventral 1/3 (= well below ozopore level), on mesozonae slightly oblique, directed dorsad and extending up to ozopore level, but on both zonae still traceable even above ozopore (Figs 10–14), more clearly so and less strongly

obliterate in ♀ fragments. Scobinae present starting with ring 8: inconspicuous, paramedian, narrow, lunular pits separated from each other by their own width, devoid of posterior fields and placed just at anterior margin of prozona. Ozopores small, inconspicuous disks, starting with ring 6, each pore lying upon line/suture both just before metazona and longitudinal line. Rather numerous light and irregular spots/sigilla on internal surface of meso- and metazonae (Fig. 11).

Gonopods (Figs 15–18). Anterior gonopods with a very strong, long, median, spear-shaped, apically rounded, sternal process (**s**), the latter only slightly longer than both coxa (**cx**) and telopodite (**t**) with its small, apical, rounded, laterally directed process (**tp**); **cx** stout, with a strong, mesal, subtriangular, apically acuminate projection (**mp**), **t** more slender than **cx**. Posterior gonopods consisting of a short, stout, subcylindrical coxa and a slender, much longer, bipar-



Figs 15–18. *Dinematocricus* aff. *bionus* Chamberlin, 1920, larger ♂ from Bio Island. 15, 16 — anterior gonopods, anterior and posterior views, respectively; 17, 18 — right posterior gonopod, anterior and posterior views, respectively. Designations explained in text. Pictures by K.V. Makarov, taken not to scale.

Рис. 15–18. *Dinematocricus* aff. *bionus* Chamberlin, 1920, более крупный ♂ с острова Био. 15, 16 — передние гоноподы, соответственно спереди и сзади; 17, 18 — правый задний гонопод, соответственно спереди и сзади. Объяснения обозначений в тексте. Фотографии К.В. Макарова, сняты без масштаба.

tite telopodite; apicolateral branch (**lb**) the longest, ca. 3x as long as a similarly flagelliform solenomere (**sl**).

REMARKS. According to Chamberlin [1920], the holotype of *Dinematocricus bionus* was ca. 145 mm in length and 11.5 mm in width, and the body with 60 segments. As nothing was said about the antennae, Jeekel [2001] assigned this species to *Dinematocricus* with but reservations, referring to the genus in quotation marks.

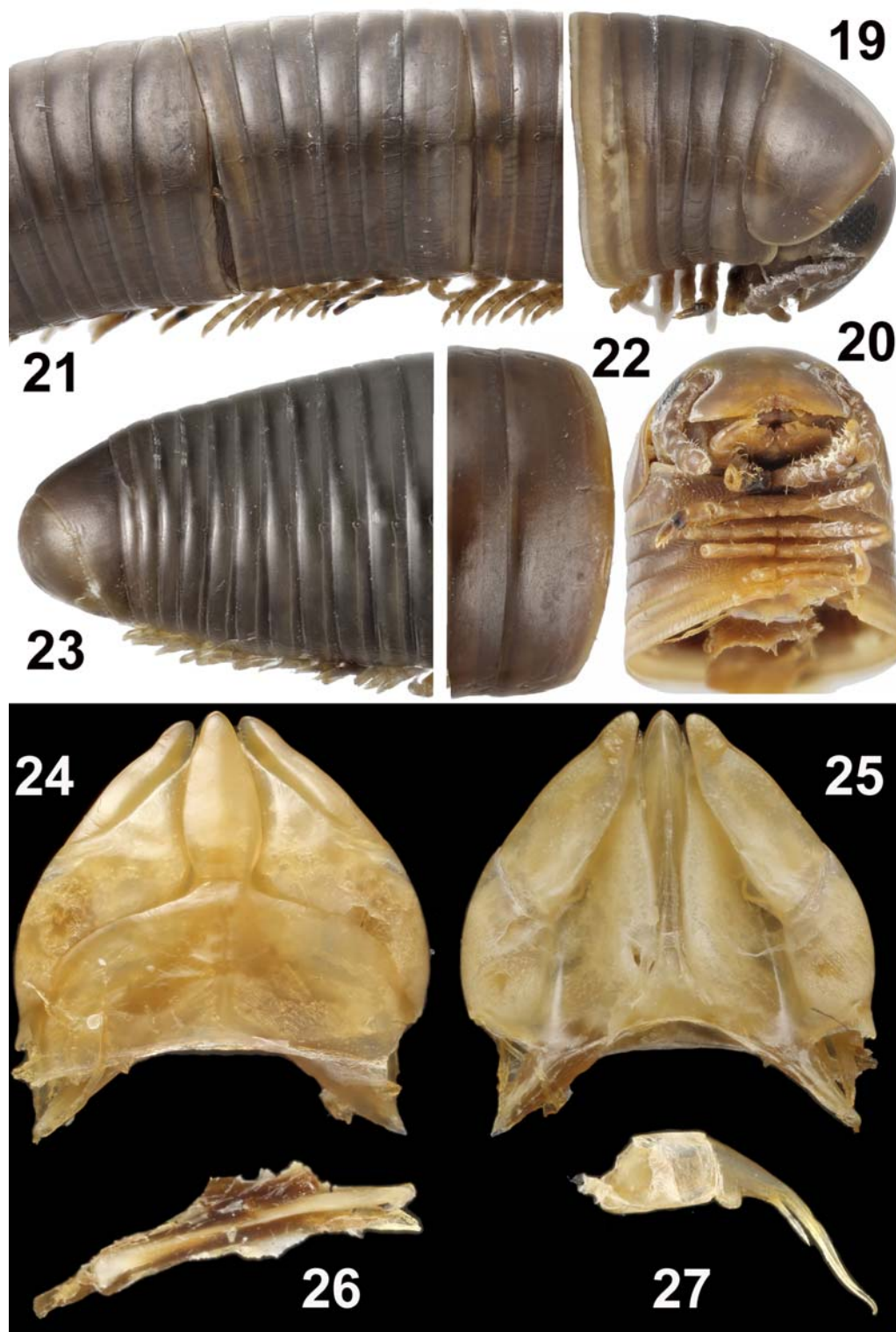
The original, purely verbal description of *D. bionus* disagrees with our account in a few, but quite important details. The holotype is much larger in length, but the same in width; the number of body segments is strikingly greater (obviously 59+T, vs. 32+T); the tegument is finely coriaceous and micro-punctate (vs. coriaceous and impunctate); the scobinae are supplied with finely striolate, triangular, posterior fields (vs. devoid of posterior fields); and the collum is narrowly rounded laterally (vs. broadly and regularly rounded).

The above strictly topotypic material from Bio Island in the ZMUM contains also 1 ♂ and 1 ♀ which are even smaller in size: length ca. 54 mm, width 6 mm, 58+1+T (♂) or length ca. 80 mm, width 8 mm, 59+T (♀); scobinae present on rings 8 to 31. Both smaller specimens fully agree in every detail to the larger subsample described above, thus allowing all ZMUM material to be considered as likely conspecific. The smaller ♂ and ♀ are only a little lighter than the larger ones, the striations on the body are less

strongly obliterate and more clearly visible, while the gonopods are almost identical (Figs 19–31). Given the remarkable size variations, could the ZMUM material belong to the same species *D. bionus*? We tend to answer positively. The main type of anamorphosis in Spirobolida being hemianamorphosis, very considerable size variations in adult conspecific Rhinocricidae have long been noted, while the gonopods grow gradually and either remain unchanged or get at least somewhat modified from one stadium to the next [Mauriès, 1980; Enghoff *et al.*, 1993; Bond *et al.*, 2003]. The above variations in *D. bionus* seem best to be accounted for by hemianamorphosis.

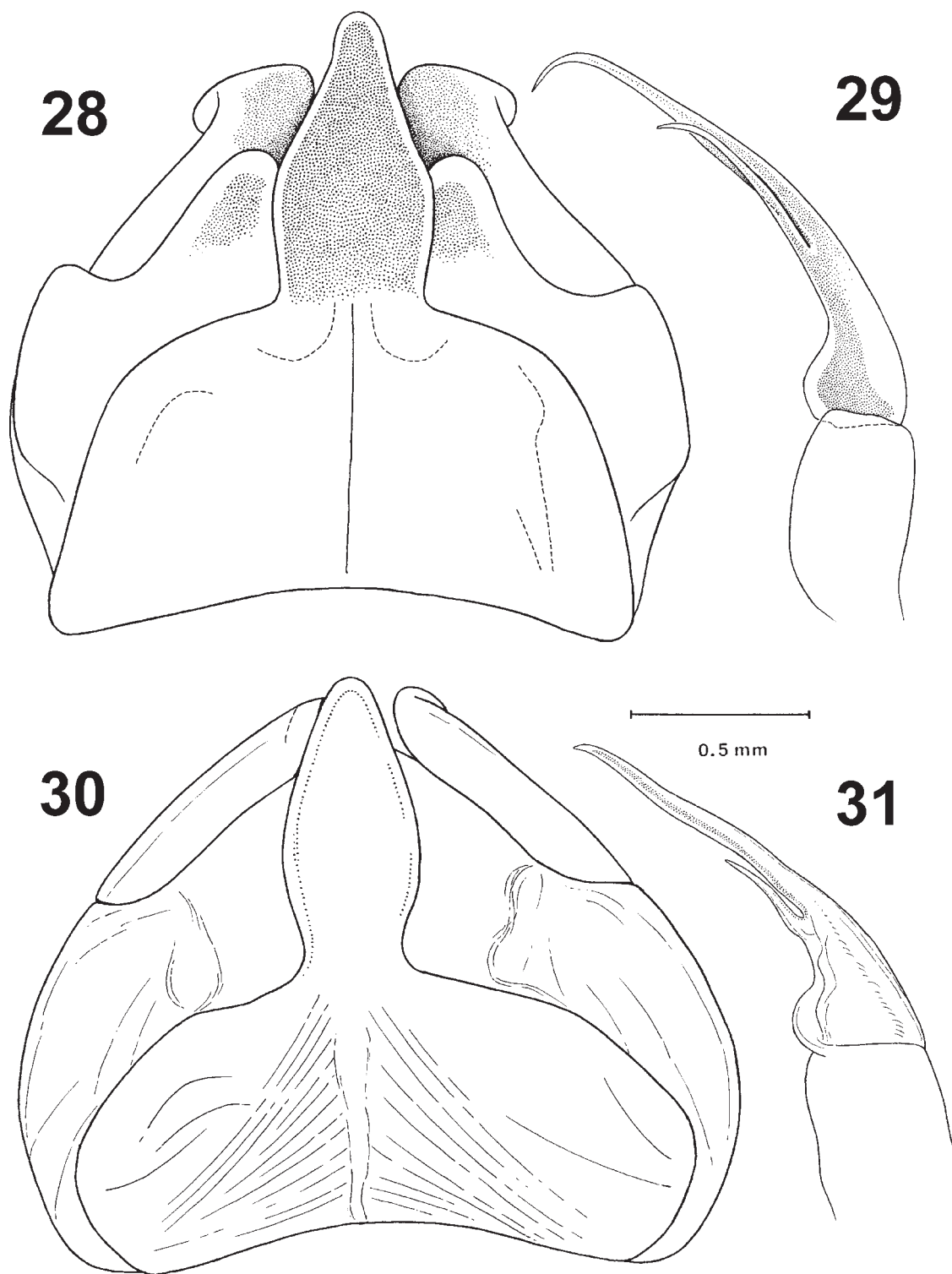
However, before the holotype of *D. bionus* is properly revised, we refrain from definitely labeling our samples.

In addition to *D. bionus*, there are at least a few other congeners, e.g. *D. carinatus* (Karsch, 1881), *D. lanceolatus* Brölemann, 1913, *D. repandus* Attems, 1914 and *D. strobilus* Attems, 1914, in which the anterior gonopods show a similarly conspicuous and spear-shaped central sternal process [Brölemann, 1913; Attems, 1914], all of them from New Guinea and/or adjacent archipelagos [Jeekel, 2001]. Thus, a syntype of *D. repandus* is illustrated here to show the remarkable similarities to *D. bionus* in gonopodal structure (Figs 32–35). Another sample that clearly belongs to the same species group and identified as *D. philistus* Attems, 1914 is available in the ZMUM collections, as follows.



Figs 19–27. *Dinematocricus* aff. *bionus* Chamberlin, 1920, smaller ♂ from Bio Island. 19, 20 — anterior part of body, lateral and ventral views, respectively; 21 — middle part of body, lateral view; 22 — midbody segment enlarged to show scobinae, dorsal view; 23 — caudal part of body, lateral view; 24, 25 — anterior gonopods, anterior and posterior views, respectively; 26, 27 — left posterior gonopod, anterior and posterior views, respectively. Designations explained in text. Pictures by K.V. Makarov, taken not to scale.

Рис. 19–27. *Dinematocricus* aff. *bionus* Chamberlin, 1920, более мелкий ♂ с острова Био. 19, 20 — передняя часть тела, соответственно сбоку и снизу; 21 — средняя часть тела, сверху; 22 — увеличенный среднетелуловый сегмент со скобинами, сверху; 23 — задняя часть тела, сбоку; 24, 25 — передние гоноподы, соответственно спереди и сзади; 26, 27 — левый задний гонопод, соответственно спереди и сзади. Объяснения обозначений в тексте. Фотографии К.В. Макарова, сняты без масштаба.



Figs 28–31. *Dinematocricus* aff. *bionus* Chamberlin, 1920, larger (28, 29) and smaller (30, 31) ♂♂ from Bio Island. 28, 30 — anterior gonopods, anterior view; 29, 31 — right posterior gonopod, posterior view.

Рис. 28–31. *Dinematocricus* aff. *bionus* Chamberlin, 1920, более крупный (28, 29) и более мелкий (30, 31) ♂♂ с острова Био. 28, 30 — передние гоноподы, спереди; 29, 31 — правый задний гонопод, сзади.



Figs 32–35. *Dinematocricus repandus* Attems, 1914, ♂ syntype from Gazelle Peninsula, East New Britain Province, Bismarck Archipelago, Papua New Guinea; slide NHMW 4027. 32, 33 — anterior gonopods, anterior and posterior views, respectively; 34, 35 — both posterior gonopods, mesal and lateral views, respectively. Scale bars: 1.0 mm.

Рис. 32–35. *Dinematocricus repandus* Attems, 1914, синтип ♂ из Газелле Пенинсулы, Восточная Новая Британия, Бисмаркский архипелаг, Папуа Новая Гвинея; микропрепарат NHMW 4027. 32, 33 — передние гоноподы, соответственно спереди и сзади; 34, 35 — оба задних гонопода, соответственно изнутри и сбоку. Масштаб: 1,0 мм.

Dinematocricus philistus Attems, 1914
Figs 36–41.

Dinematocricus philistus Attems, 1914: 322, a brief original description in a key couplet; several syntypes from Seram and Ambon islands, Moluccas, Indonesia.

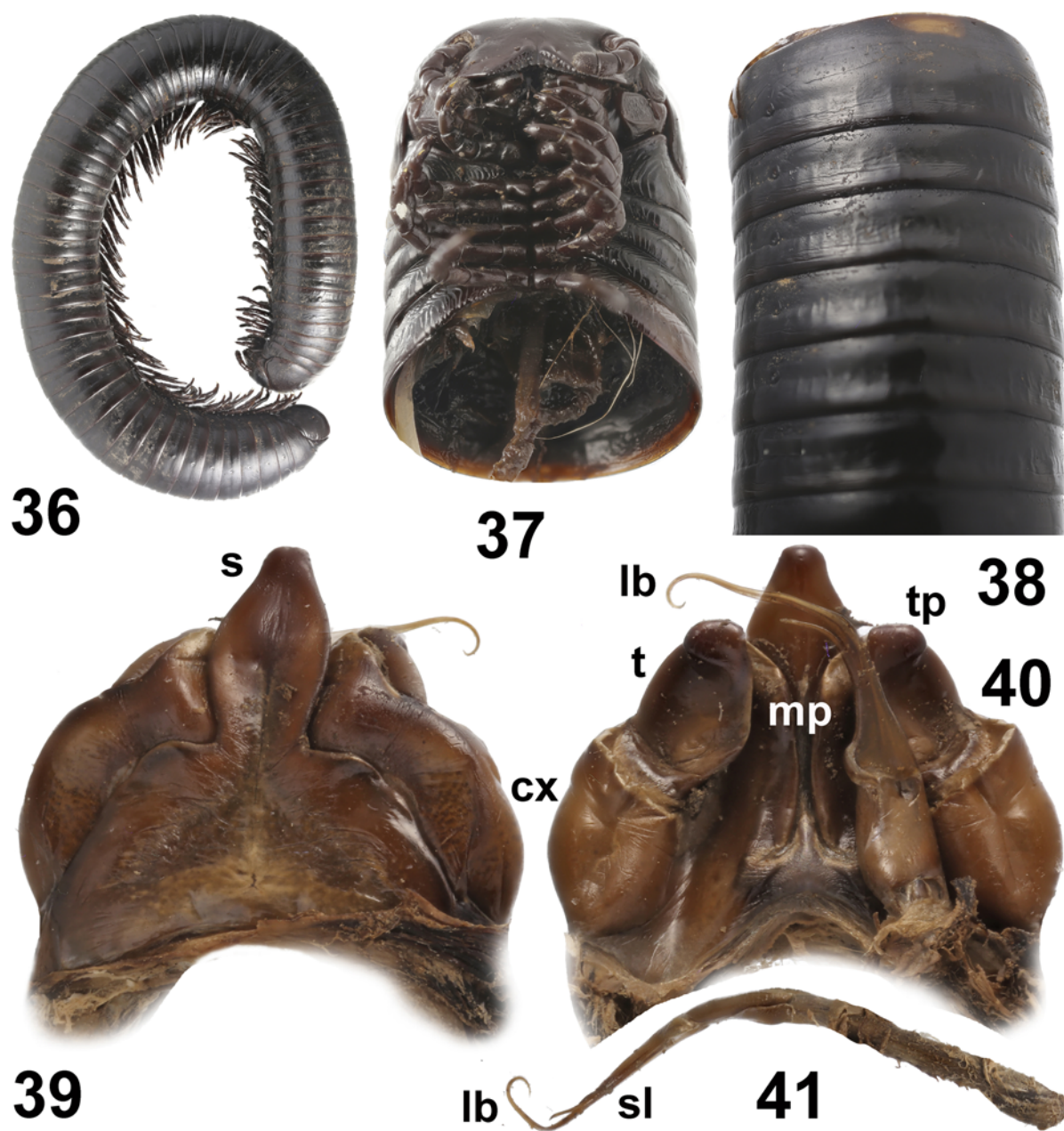
Dinematocricus philistus — Attems, 1915: 11, a detailed and illustrated description [Attems, 1915].

MATERIAL: 1 ♂ (ZMUM), eastern Indonesia, Maluku Tengah Prov., Molucca (= Maluku) Islands, northern Seram (formerly Ceram) Island, near Horale (Saka) village, S02°56'15", E129°04'54", shrubs and secondary lowland tropical forest, on road, 6.IV.2009, M. Kalniņš & P. Pipkalēja leg.; 1 ♀ (ZMUM), Central Moluccas Province (= Maluku Tengah), Lease Islands S of Seram, Saparua Island, 1.5 km NE of Kota Saparua, S03°33'31", E128°39'50", secondary lowland tropical forest, 10.IV.2009, M. Kalniņš leg.

DESCRIPTION. Topotype ♂ from Seram ca. 80 mm long, 6.0 mm wide, with 53p+T segments. ♀ ca. 82 mm long, 10.0 mm wide, with 57p+T segments. Colouration uniformly blackish to blackish brown; collum narrowly dark reddish along both anterior and caudal margins, following metazonae narrowly cingulate, similarly vague and dark reddish at caudal margin; prozonae often with yellow spots around/near scobinae; legs grey- or red-brown; labrum, antennae and most of telson dark brown, eye patches blackish (Figs 36–38).

All characters as in *Propodobolus* sp., except as follows.

Tegument smooth and shining, mostly very delicately incised. Epicranial suture short and fully or almost fully obliterate. Antennae very short and stout, only antennomeres 5–7 densely setose (Figs 36, 37).

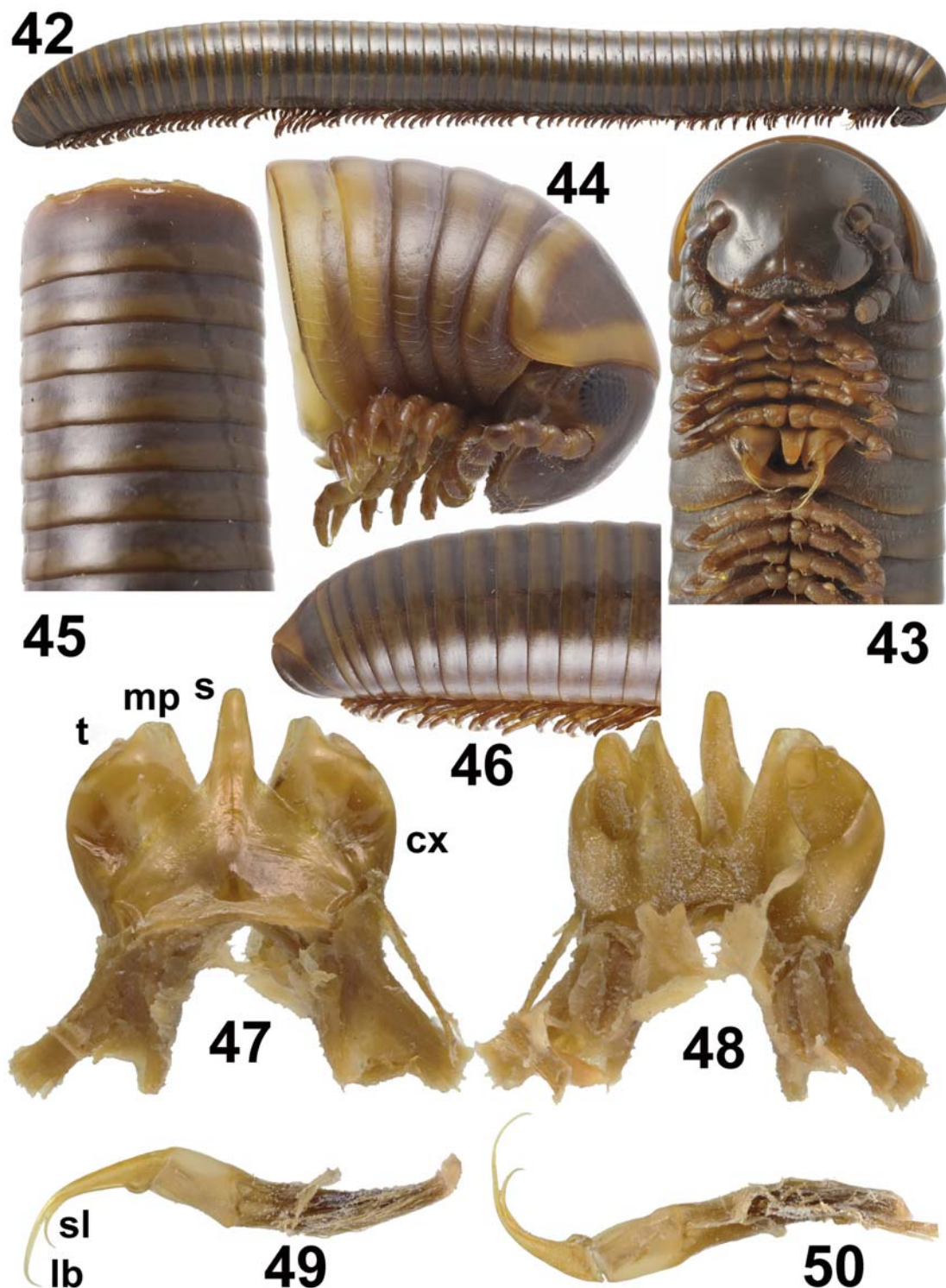


Figs 36–41. *Dinematocricus philistus* Attems, 1914, ♂ from Seram. 36 — habitus, lateral view; 37 — anterior part of body, ventral view; 38 — body segments 9–15, dorsal view; 39, 40 — both anterior gonopods and left posterior gonopod, anterior and posterior views, respectively; 41 — isolated right posterior gonopod, posterior view. Designations explained in text. Pictures by K.V. Makarov, taken not to scale.

Рис. 36–41. *Dinematocricus philistus* Attems, 1914, ♂ с острова Серам. 36 — общий вид, сбоку; 37 — передняя часть тела, снизу; 38 — сегменты тела 9–15, сверху; 39, 40 — оба передних гонопода и левый задний гонопод, соответственно спереди и сзади; 41 — изолированный правый задний гонопод, сзади. Объяснения обозначений в тексте. Фотографии К.В. Макарова, сняты без масштаба.

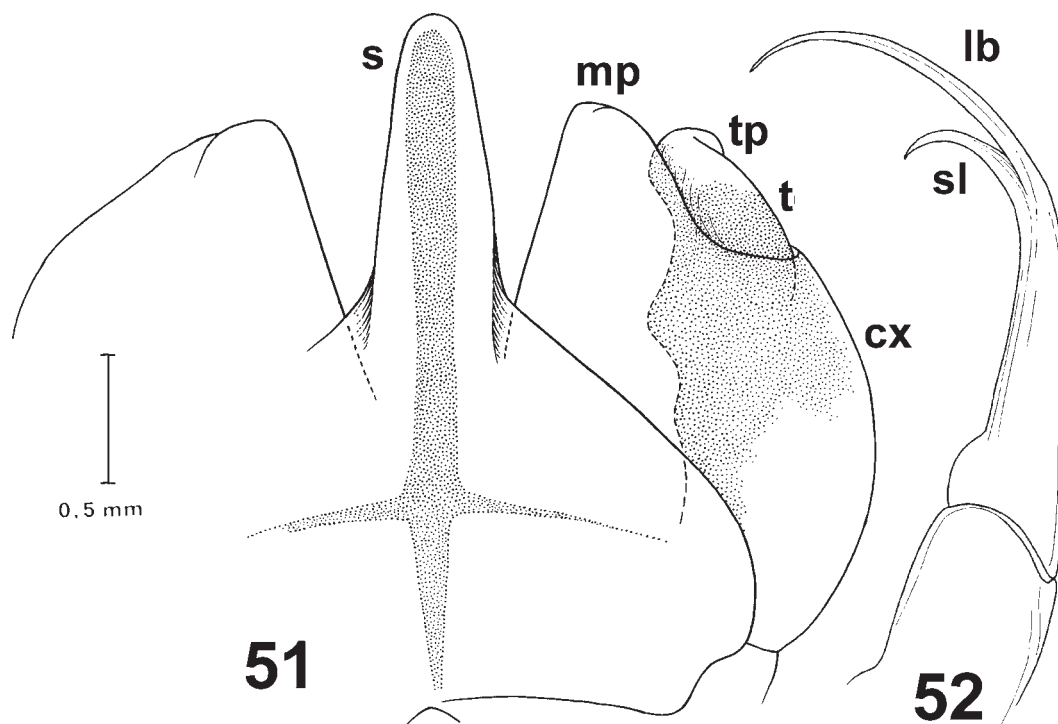
Interantennal isthmus ca. 2x diameter of antennal socket. Collum broadly and regularly rounded laterally, anterior and lateral margins clearly, but narrowly bordered (Fig. 36). Midbody segments/rings faintly striate to striolate, more densely and clearly so ventrad, striations on dorsum above ozopore level being strongly obliterate, often abbreviated, but visible (Figs 36–38). Scobinae present, starting with

ring 8 and traceable at least until midbody segments: inconspicuous, paramedian, narrow, lunular pits separated from each other by ca. 1.3x their own width, devoid of posterior fields and placed just at anterior margin of prozona (Fig. 38). Ozopores small, inconspicuous disks, starting with ring 6, each pore lying upon line/suture both just before metazona and below longitudinal line. Rather numerous light and



Figs 42–50. *Dinematocricus* aff. *disjunctus* Brölemann, 1913, ♂ from MacLay Coast. 42 — habitus, lateral view; 43, 44 — anterior part of body, ventral and lateral views, respectively; 45 — body segments 9–14, dorsal view; 46 — posterior part of body, lateral view; 47, 48 — anterior gonopods, anterior and posterior views, respectively; 49, 50 — isolated left posterior gonopod, anterior and posterior views, respectively. Designations explained in text. Pictures by K.V. Makarov, taken not to scale.

Рис. 42–50. *Dinematocricus* aff. *disjunctus* Brölemann, 1913, ♂ с Берега Маклая. 42 — общий вид, сбоку; 43, 44 — передняя часть тела, соответственно снизу и сбоку; 45 — сегменты тела 9–14, сверху; 46 — задняя часть тела, сбоку; 47, 48 — передние гоноподы, соответственно спереди и сзади; 49, 50 — изолированный левый задний гонопод, соответственно спереди и сзади. Объяснения обозначений в тексте. Фотографии К.В. Макарова, сняты без масштаба.



Figs 51–52. *Dinematocricus* aff. *disjunctus* Brölemann, 1913, ♂ from Maclay Coast. 50 — anterior gonopods, anterior view; 51 — right posterior gonopod, posterior view. Designations explained in text.

Рис. 51–52. *Dinematocricus* aff. *disjunctus* Brölemann, 1913, ♂ с Берега Маклая. 50 — передние гоноподы, спереди; 51 — правый задний гонопод, сзади. Объяснения обозначений в тексте.

irregular spots/sigilla on internal surface of meso- and metazonae. Epiproct small, especially strongly flattened dorso-ventrally. Paraprocts only faintly swollen along caudal margin (Fig. 36).

Legs ca. 2/3 (♂) or 1/3 (♀) as long as body height, fully devoid of sole pads, ♂ coxae 3–5 swollen ventrally (Fig. 37), a spine each above and below claw.

Gonopods (Figs 39–41). Anterior gonopods with a very strong, long, unusually broad, median, spear-shaped, apically rounded, sternal process (**s**), the latter being much longer/higher than both coxa (**cx**) and telopodite (**t**) with its small, apical, rounded, caudolaterally directed process (**tp**); **cx** stout, with a strong, mesal, subtriangular projection (**mp**), **t** much more slender than **cx**. Posterior gonopods consisting of a shorter, relatively stout, subcylindrical coxa and a slender, much longer, bipartite telopodite; apicolateral branch (**lb**) the longest, >2x as long as a similarly flagelliform solenomere (**sl**).

REMARKS. Based on Attems [1914, 1915], in particular the extended description and figs 19–21, at least the above ♂ topotype is well identifiable as *D. philistus*, another species with a strongly spear-shaped central sternal process of the anterior gonopods (Figs 39, 40). However, this process **s** seems to be unusually hypertrophied in *D. philistus* compared to the remaining congeners from the same species group. Minor variations in *D. philistus* concern the colouration (uniformly blackish to blackish brown, vs. dark olive to red-brown in the description), body size (♂ ca. 80 mm long and 6.0 mm wide, with 53p+T segments, vs. ≥ 75 mm long and 8–9.5 mm wide, with 49–59p+T segments in the description), scobinae starting with segment 8 (and present until segment 38, according to the description) etc. Syntypes of *D. philis-*

tus (NHMW 2364): 1 dissected ♂, 1 ♀, 2 micro preparations, Indonesia, Molukken, Ambon, L.F. Beaufort leg.

Dinematocricus aff. *disjunctus* Brölemann, 1913 Figs 42–52.

Dinematocricus disjunctus Brölemann, 1913: 134, original description from the ♂ holotype from an unspecified locality in New Guinea.

MATERIAL. 5 ♂♂, 4 ♀♀, 2 ♀♀ juv. (ZMUM), Papua New Guinea, Maclay Coast, near Kepoiak, S5°45', E146°35', forest litter, 13.II.1977, G.F. Kurcheva leg.

DESCRIPTION. Adults ca. 82–90 mm long, 7.0–9.0 mm wide, with 53–56p+T segments (♂, ♀), presumed subadults 52 or 54 mm long and 6.0 mm wide, with 52p+1ap+T segments. Colouration in adults dark red-brown to dark grey-brown, pattern mostly clear due to metazonae and anterior parts of prozonae being cingulate and lighter reddish to yellowish (Figs 42, 44–46). Collum broadly flavous along both anterior and posterior margins (Fig. 42, 44). Epiproct similarly flavous (Fig. 46) or uniformly dark brown like head. Legs light to dark red-brown.

All characters as in *Propodobolus* sp., except as follows.

Tegument smooth and shining, mostly very delicately vermiculate. Interantennal isthmus ca. 2x diameter of antennal socket. Collum broadly and regularly rounded laterally, anterior and lateral margins clearly, but narrowly bordered. Midbody segments/rings faintly striate to striolate, more densely and clearly so ventrad, striations on dorsum above ozopore level completely obliterate. Scobinae present, starting with ring 8 and traceable at least until midbody segments: inconspicuous, paramedian, narrow, lunular pits sep-

arated from each other by their own width and devoid of posterior fields. Ozopores small, inconspicuous disks, starting with ring 6, each pore lying upon line/suture both just before metazona and longitudinal line. Numerous light and irregular spots/sigilla on internal surface of meso- and metazonae. Epiproct small, faintly concave near midway in lateral view, flattened dorsoventrally. Paraprocts only faintly swollen along caudal margin.

Legs ca. $1/2$ (σ) or $1/3$ (φ) as long as body height; faint sole pads present only on σ tarsi, σ coxae 3–5 swollen ventrally, a spine each above and below claw.

Gonopods (Figs 47–52). Anterior gonopods with a slender, central, apically rounded, sternal process (**s**), the latter being a little longer/higher than both coxa (**cx**) and telopodite (**t**) with its small, apical, rounded, caudolateral process (**tp**); **cx** stout, with a strong, mesal, rounded, subtriangular projection (**mp**), **t** more slender than **cx**. Posterior gonopods consisting of a shorter, relatively stout, subcylindrical coxa and a slender, much longer, bipartite telopodite; apicolateral branch (**lb**) the longest, $>3\times$ as long as a similarly flagelliform solenomere (**sl**).

REMARKS. Based on Brölemann [1913], variations in *D. aff. disjunctus* compared to the original description concern the colouration (dark red-brown to dark grey-brown, with a mostly clearly cingulate pattern of lighter reddish or yellowish metazonae and anterior parts of prozonae, vs. dull ochraceous with brown caudal margins of metazonae in the description), body size (adults ca. 82–90 mm long and 7.0–9.0 mm wide, with 53–56p+T segments, vs. holotype 57 mm long and 5.0 mm wide, with 52p+2ap+T segments in the original description), scobinae (starting with segment 8 and present at least until midbody rings, vs. ca. 14 and present until about segment 30, according to the original description). In addition, since the anterior gonopods of the holotype show a slightly higher/longer, albeit similarly slender central sternal process and considerably higher/longer telopodites [Brölemann, 1913], the identity of the samples from MacLay Coast is bound to remain provisional.

Dinematocricus aff. faucium Brölemann, 1913
Figs 53–76.

Dinematocricus faucium Brölemann, 1913: 129, original description from the σ holotype from Thursday Island, Torres Strait Islands, Queensland, Australia.

MATERIAL. 11 σ , 13 φ , 3 φ juv. (ZMUM), Papua New Guinea, Trobriand Archipelago, Kiriwina Island, 24.I.1977, G.F. Kurcheva leg.

DESCRIPTION. Adults mostly ca. 85–120 mm long and 8.5–11.5 wide (σ , φ), with 53–59p+T segments (σ , φ), presumed subadults 53–78 mm long and 5–6 mm wide, with 45p+4ap+T, 53p+3ap+T or 55 p+3ap+T segments. A single deviant σ ca. 52 mm in length, ca. 5.5 mm in width, with 47p+4ap+T segments (see below). Colouration grey-brown to brown, pattern indistinctly cingulate due to darker brown metazonae and distinctly cingulate due to yellowish or light brown prozonae (Figs 53–60). Collum sometimes narrowly flavous along anterior margin (Fig. 53). Epiproct often similarly flavous dorsally (Figs 56, 60) Epiproct (Fig. 46) uniformly dark brown like head. Legs light to dark grey-brown. Presumed juveniles mostly greyish. Eye patches usually blackish brown, in adults each composed of 36–45 ommatidia arranged in 6–8 vertical rows.

All characters as in *Propodobolus* sp., except as follows.

Tegument smooth and shining, mostly very delicately vermiculate. Interantennal isthmus ca. $2\times$ diameter of antennal socket. Collum broadly and regularly rounded laterally, anterior and lateral margins, as well as caudolateral corner clearly, but narrowly bordered. Midbody segments/rings faintly striate to striolate, more densely and clearly so ventrad, striations on dorsum above ozopore level completely obliterate. Scobinae present, starting with ring 8 and traceable at least until last few segments: inconspicuous, paramedian, narrow, lunular pits separated from each other by ca. $3\times$ their own width, each with a small posterior field (Figs 54, 59). Ozopores small, inconspicuous disks, starting with ring 6, each pore lying upon line/suture both just before metazona and longitudinal line. Numerous light and irregular spots/sigilla on internal surface of meso- and metazonae. Epiproct small, faintly concave near proximal third in lateral view, flattened dorsoventrally. Paraprocts very clearly swollen along caudal margin (Figs 56, 60).

Legs ca. $1/2$ (σ) or $1/3$ (φ) as long as body height; distinct sole pads present only on σ tarsi, gradually reduced towards posterior body third. σ coxae 3–5 swollen ventrally (Fig. 58), a spine each above and below claw.

Gonopods (Figs 61–66). Anterior gonopods with a strong, central, distally broadened and apically narrowly rounded, sternal process (**s**), the latter being much longer/higher than both coxa (**cx**) and telopodite (**t**) with its small, apical, rounded, caudolateral process (**tp**); **cx** stout, with a moderate, elongate, mesal, subtriangular projection (**mp**), **t** more slender than **cx**. Posterior gonopods consisting of a shorter, relatively stout, subcylindrical coxa and a slender, much longer, bipartite telopodite; apicolateral branch (**lb**) the longest, $>3\times$ as long as a similarly flagelliform solenomere (**sl**).

REMARKS. Among the σ in the above series the smallest one (length ca. 52 mm, width ca. 5.5 mm, with 47p+4ap+T segments) superficially looks much the same as the others (Figs 69–74), but the σ sole pads are missing, the scobinae are only ca. $2\times$ apart from each other and show better developed posterior fields (Fig. 70), whereas the gonopods (Figs 67, 68, 71–74), both anterior and posterior, differ in the central sternal process (**s**) of the anterior gonopods being slightly bifid, club-shaped and considerably shorter than the telopodite (**t**), the medial projections (**mp**) of the coxite (**cx**) are relatively more prominent, and the entire posterior gonopod is much shorter. This sole σ may prove to belong to a different species, but given the entire body of evidence, including the smallest body size, the increased number of apodous segments, the absence of sole pads, the clearly shortened posterior gonopods etc., on balance we tend to regard that deviant σ as abnormal and somewhat underdeveloped, perhaps premature, and thus it seems conspecific with the other material. The development of most Spirobolida being hemianamorphic, that of the gonopods in some members has long been known to be gradual [Mauriès, 1980; Enghoff *et al.*, 1993; Bond *et al.*, 2003], in *D. aff. faucium* likely getting modified at least between certain prematuration moults (cf. above under *D. aff. bionus*).

Among the other variable characters, we can mention a lighter, rather vague dorsal spot on the dorsal side of the epiproct that is noticeable in several specimens. Carl [1918] distinguished that morph as the variety *fulvosignatus*, from an unspecified place in New Guinea, in which that light spot was clear. This variety still remains such and has no status in the nomenclature.

Some of the features of *D. faucium* which Attems [1914] recorded from samples from the mainland of eastern Papua



Figs 53–56. *Dinematocricus* aff. *faucium* Brölemann, 1913, larger ♂ from Kiriwina Island. 53 — anterior part of body, lateral view; 54 — body segments 8 and 9, dorsal view; 55 — middle part of body, lateral view; 56 — posterior part of body, lateral view. Pictures by K. V. Makarov, taken not to scale.

Рис. 53–56. *Dinematocricus* aff. *faucium* Brölemann, 1913, крупный ♂ с острова Киривина. 53 — передняя часть тела, сбоку; 54 — сегменты тела 8 и 9, сверху; 55 — средняя часть туловища, сбоку; 56 — задняя часть тела, сбоку. Фотографии К.В. Макарова, сняты без масштаба.

New Guinea differed from the original description so significantly that Jeekel [2001] suggested that they belonged to a species other than *D. faucium*. We believe that until more comparative material becomes available for study, the identity of the Kiriwina material is bound to remain but provi-

sional. According to Brölemann [1913], the holotype from an island off Queensland, Australia was 112 mm long, 9.5 mm wide, with 54p+1ap+T segments, blackish brown with red-brown cingula along the caudal margins of metazonae and a bright brown-red telson; scobinae are present on seg-



Figs 57–60. *Dinematocricus* aff. *faucium* Brölemann, 1913, larger ♂ from Kiriwina Island. 57, 58 — anterior part of body, lateral and ventral views, respectively; 59 — midbody segments, dorsal view; 60 — posterior part of body, lateral view. Pictures by K.V. Makarov, taken not to scale.

Рис. 57–60. *Dinematocricus* aff. *faucium* Brölemann, 1913, крупный ♂ с острова Киривина. 57, 58 — передняя часть тела, соответственно сбоку и снизу; 59 — среднетуловищные сегменты тела, сверху; 60 — задняя часть тела, сбоку. Фотографии К.В. Макарова, сняты без масштаба.

ment 8 to about 36th, separated from each other by about 1.5x their diameter and each showing a posterior field; the anal valves are bordered near the caudal margin; and ♂ tarsi are devoid of sole pads. The anterior gonopods, however, are exactly the same as in Figs 61, 62, 65 and 66.

Genus *Eurhinocricus* Brölemann, 1903

Type species: *E. biolleyi* Brölemann, 1903, by monotypy.

COMMENT. This rather large genus of Rhinocricidae presently comprises 34 species or subspecies which are mostly endemic to South and Central America, ranging from Brazil and Bolivia in the south to northern Mexico in the north (also introduced to the southern U.S.A.) [Jeekel, 2001; Marek *et al.*, 2003; <https://bugguide.net/node/view/103681>]. Only two species are remarkable exceptions, one from the Caroline Islands and the other from the Marianas, both in Micronesia [Jeekel, 2001]. Following both Attems [1914] and Hoffman [1955], this tetraconocerate genus is distinguished through the structure of the posterior gonopod, in which the solenomere is a shorter mesal branch, while the main, outer

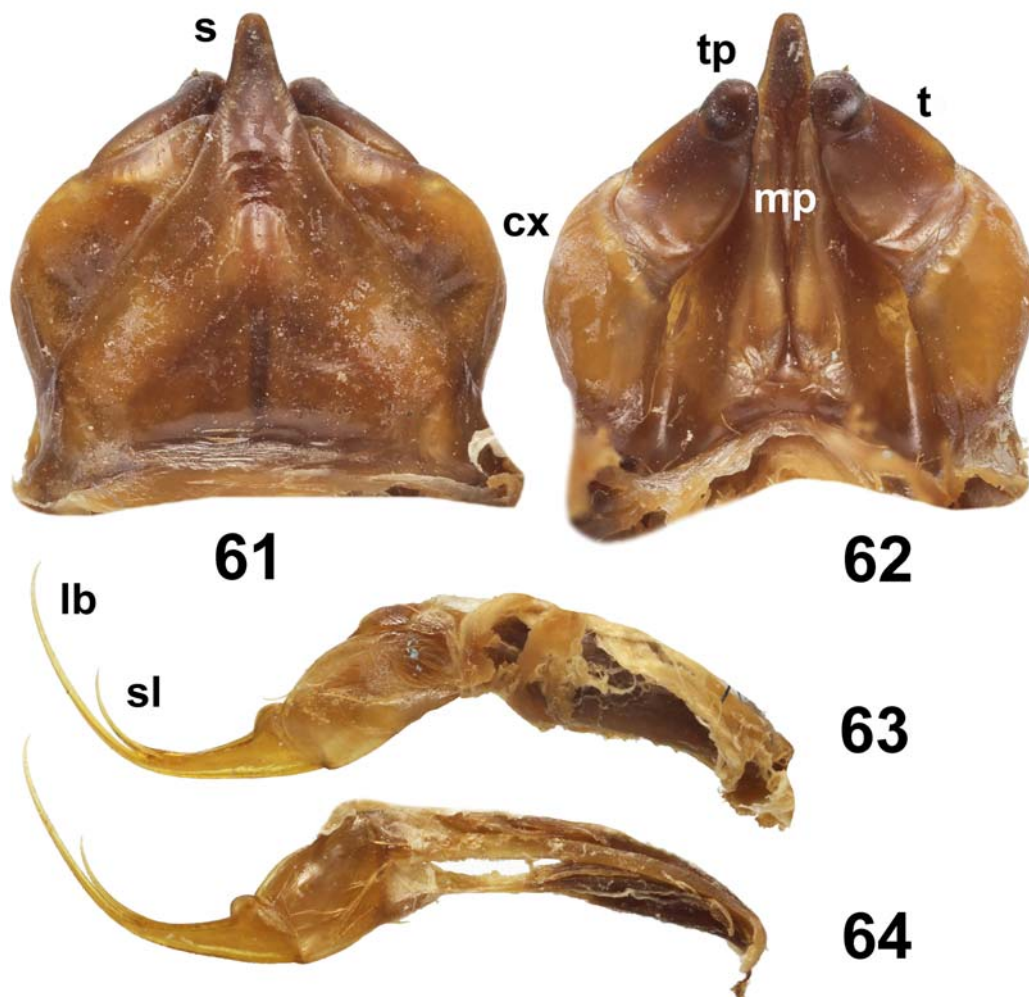
branch is flattened, blade-shaped and apically usually subtruncate, not truly flagelliform. As noted above, some *Eurhinocricus* species from the Antilles also fit in the diagnoses of *Australocricus* and *Propodobolus* (cf. Bond, Sierwald [2002]).

Eurhinocricus sp. Figs 75–85.

MATERIAL. 3 ♂♂, 1 ♀, 1 juv. (ZMUM), Fiji, Viti Levu Island, Suva Botanical Garden, 16.III.1977, G.F. Kurcheva leg.

DESCRIPTION. Length 18–23 (♂) or 25 mm (♀), width 1.8–2.1 (♂) or 2.4 mm (♀). Adults with 36–38p+1–2ap+T segments. Colouration rather uniformly grey- to red-brown (Figs 75–80), only antennae and legs light red-yellow, and eye patches blackish; a faint dorsal pattern of lighter, vague, paramedian, rather wide stripes consisting of comma-shaped spots on each ring (Fig. 79).

Body cylindrical, postcollum constriction very faint (Fig. 77). Head as usual, three small central teeth at fore margin of and a superficial, fine, axial suture on labrum, with ca. 10+10 labral and 2+2 supralabral setae. Eye fields subcircu-



Figs 61–64. *Dinematocricus* aff. *faucium* Brölemann, 1913, larger ♂ from Kiriwina Island. 61, 62 — anterior gonopods, anterior and posterior views, respectively; 63, 64 — posterior gonopods, anterior and posterior views, respectively. Designations explained in text. Pictures by K.V. Makarov, taken not to scale.

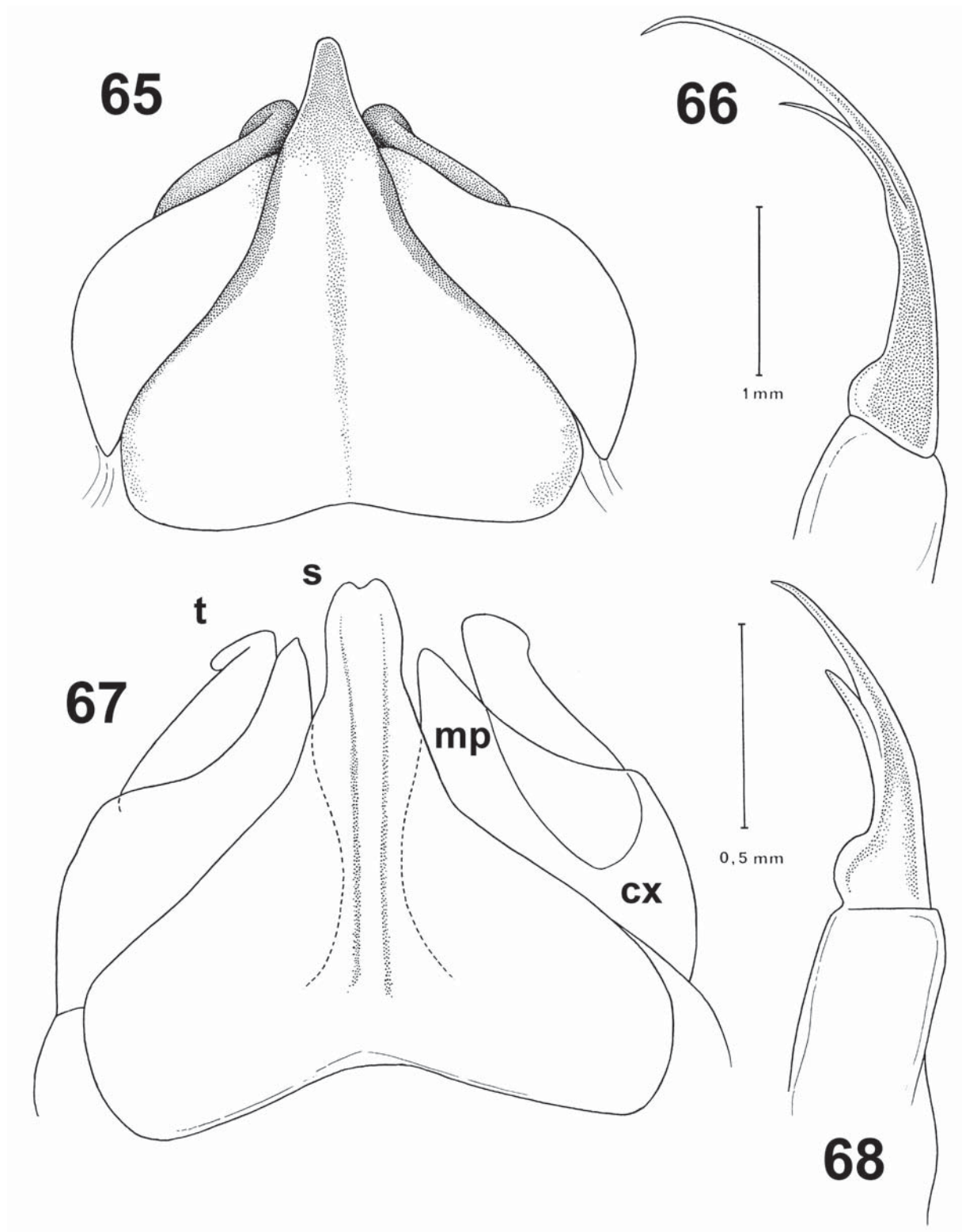
Рис. 61–64. *Dinematocricus* aff. *faucium* Brölemann, 1913, крупный ♂ с острова Киривин. 61, 62 — передние гоноподы, соответственно спереди и сзади; 63, 64 — задние гоноподы, соответственно спереди и сзади. Объяснения обозначений в тексте. Фотографии К.В. Макарова, сняты без масштаба.

lar, large, ommatidia flat, ca. 32–34 per patch, arranged in 6–7 vertical rows (Figs 75, 76), isthmus ca. 2x diameter of eye patch (Fig. 77). Antennae short and clavate, curved anteroventrad, *in situ* stretchable laterally behind caudal margin of collum; antennomeres 1–6 subequal in length, antennomeres 5–7 considerably more strongly setose than others, 7th shortest, 8th with four small apical cones (Figs 75–77). Tegument bare, smooth and mostly shining (Figs 75–80). Collum very broadly rounded and clearly, but rather narrowly bordered laterally (Figs 75, 76). Midbody segments/rings devoid of evident sutures between zonae; meso- and metazonae unusually distinctly and densely striate across entire circumference, slightly more densely so ventrad, ca. 6–8 striae per square equal to their length just below ozopore level, longitudinal on metazonae, slightly oblique and directed dorsad on mesozonae, very delicate, dense, vertical and often confused on prozonae; striations on meso- and metazonae mostly regular, only in places abbreviated, confused only mid-dorsally and near ozopore (Figs 75–80).

Scobinae absent. Ozopores small, inconspicuous, starting with segment/ring 6, each pore lying upon line/suture just before metazona on a vague and minute boss. Telson (Figs 75, 80) as usual, epiproct flat, caudally rounded and very small; paraprocts strongly and regularly convex, smooth, not bordered along caudal margin, with only a small and inconspicuous gutter between both valves; hypoproct strongly transverse and caudally rounded. Only ♂ segment 7 clearly swollen ventrally (Fig. 75), a complete ring due to a strong ventral bridge in caudal half. Very small and numerous, light and irregular spots/sigilla on internal surface of meso- and metazonae (Fig. 77).

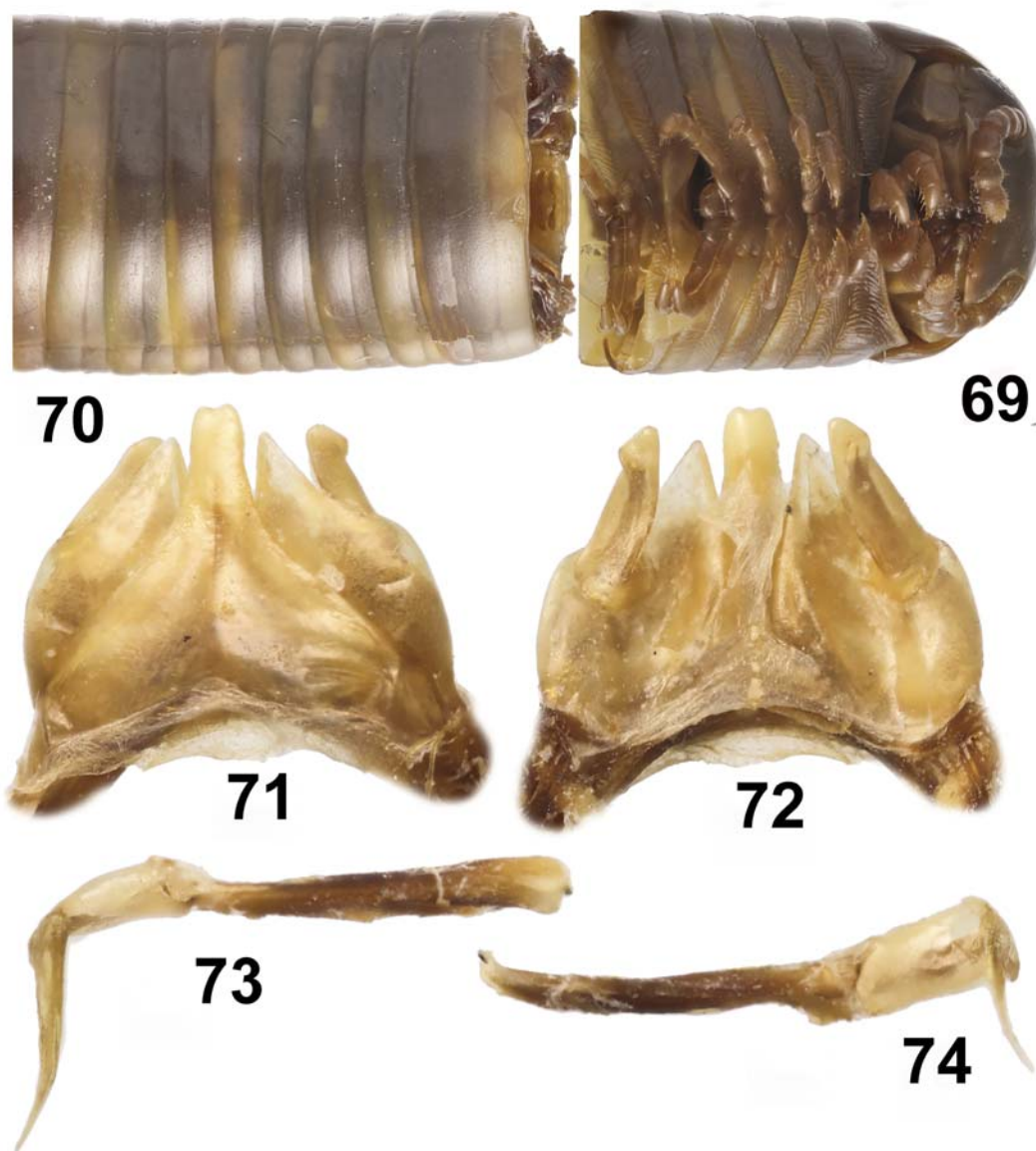
Legs relatively long and slender (♂, ♀), ca. 2/3–3/4 as long as midbody height, each usually with a spine below and above claw; only ♂ legs 1 and 2 somewhat shorter; ventral sole pads wanting (Fig. 75–78, 80).

Gonopods (Figs 81–85). Anterior gonopods with a strong, median, slender, finger-shaped, apically rounded, sternal process (s), the latter only slightly longer than both coxa



Figs 65–68. *Dinematocricus* aff. *faucium* Brölemann, 1913, larger (65, 66) and smaller (67, 68) ♂♂ from Kiriwina Island. 65, 67 — anterior gonopods, anterior view; 66, 68 — right posterior gonopod, anterior view.

Рис. 65–68. *Dinematocricus* aff. *faucium* Brölemann, 1913, крупный (65, 66) и мелкий (67, 68) ♂♂ с острова Киривина. 65, 67 — передние гоноподы, спереди; 66, 68 — правый задний гонопод, спереди.

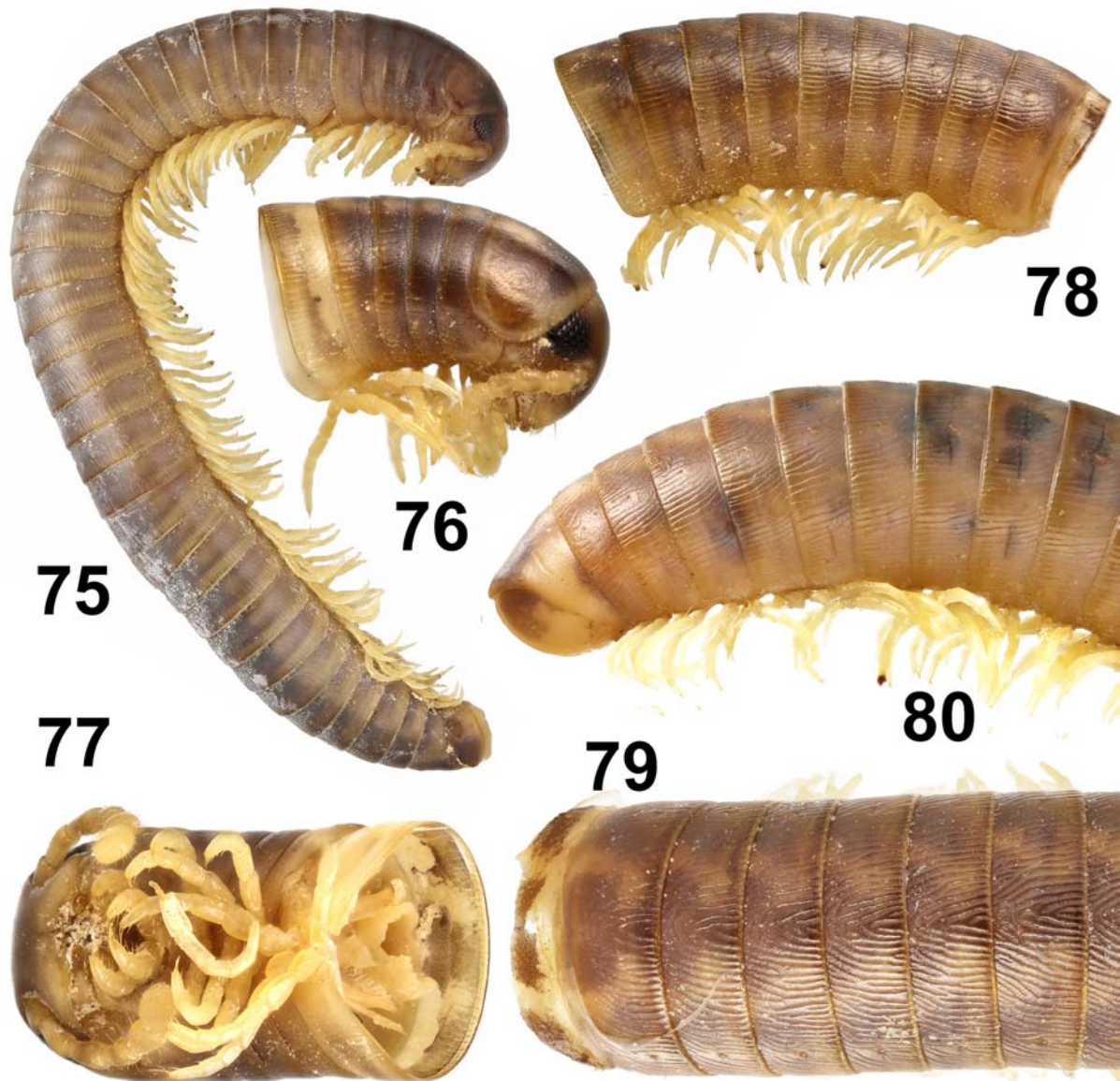


Figs 69–74. *Dinematocricus* aff. *faucium* Brölemann, 1913, smaller ♂ from Kiriwina Island. 69 — anterior part of body, ventral view; 70 — midbody segments, dorsal view; 71, 72 — anterior gonopods, anterior and posterior views, respectively; 73, 74 — posterior gonopods, anterior and posterior views, respectively. Pictures by K.V. Makarov, taken not to scale.

Рис. 69–74. *Dinematocricus* aff. *faucium* Brölemann, 1913, мелкий ♂ с острова Киривина. 69 — передняя часть тела, снизу; 70 — среднетуловищные сегменты, сверху; 71, 72 — передние гоноподы, соответственно спереди и сзади; 73, 74 — задние гоноподы, соответственно спереди и сзади. Фотографии К.В. Макарова, сняты без масштаба.

(**cx**) and telopodite (**t**) with its small, apical, rounded, laterally directed process (**tp**); **cx** the largest, with a strong, mesal, subtriangular, ventrally indistinctly tuberculate projection (**mp**) and a moderate apicolateral swelling (**sw**), both subtending a relatively slender **t**. Posterior gonopods connected with a small, membranous, ribbon-shaped sternum, each gonopod consisting of a short, stout, subcylindrical coxa (**cx2**) and a slender, much longer, bipartite telopodite (**t2**); apicolateral branch (**lb**) the largest, slender throughout, ribbon-shaped, slightly curved in subapical part, subtruncate apically; mesal branch (= solenomere, **sl**) much shorter, bacilliform, originating at about basal 1/3 and extending until about 1/5 of **t2**.

REMARKS. Superficially, had it not been for Fiji as the place of provenance, this species could have easily been described as new, because no *Eurhinocricus* sp. has ever been recorded south of the Mariana Islands in the southern Pacific. The species from Fiji is highly peculiar and easy to distinguish primarily in showing the metazonae clearly striated across the circumference (Figs 75, 76, 78–80), while the gonopods, both anterior and posterior, are with several characteristically shaped outgrowths (Figs 81–85). Moreover, the above specimens differ well from a (morphologically similar) unidentified species and the two hitherto described congeners from Micronesia at least in gonopodal structure. Thus, *E. naufragus* Carl, 1918, from Atoll Uliti, Carolines,

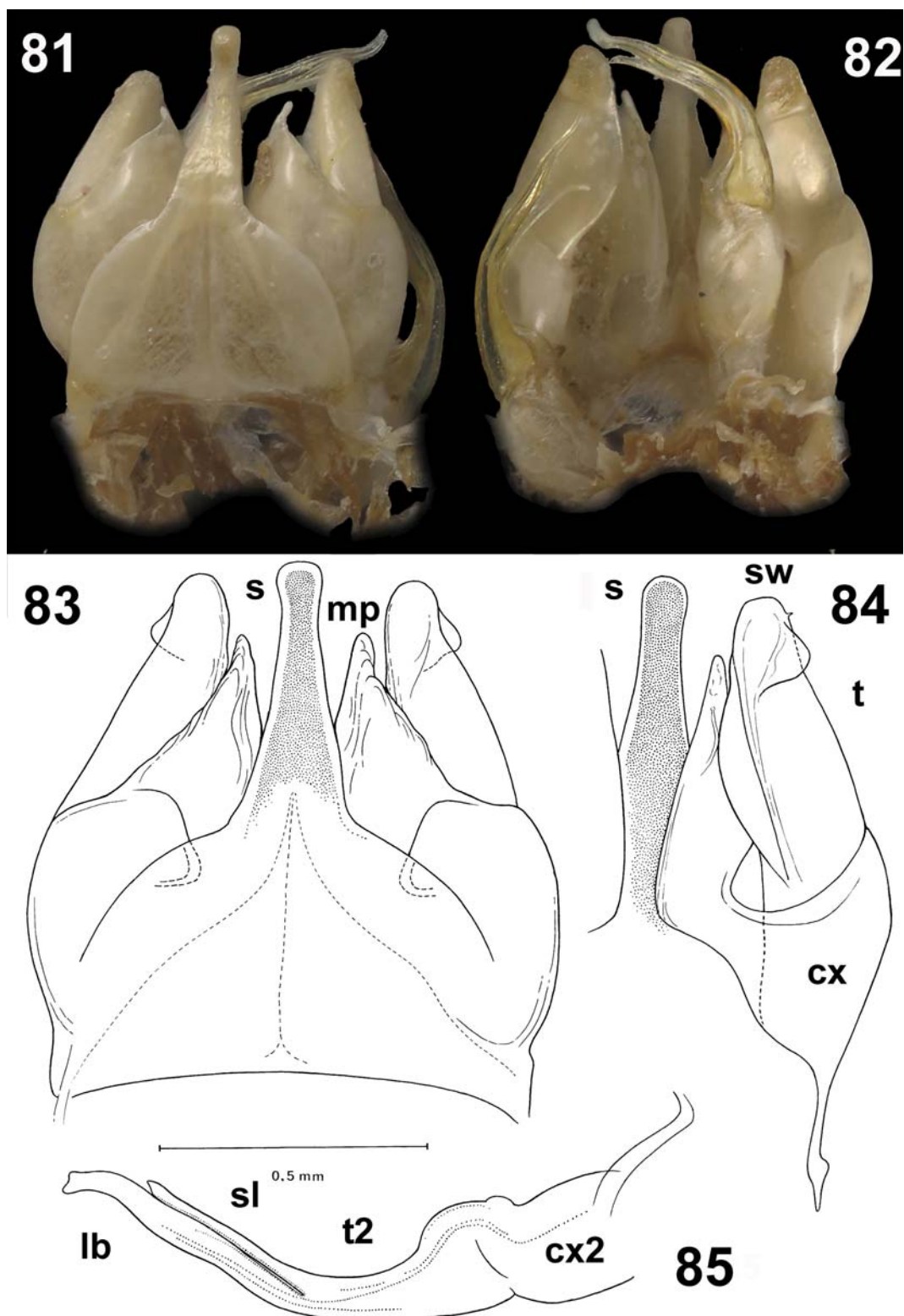


Figs 75–80. *Eurhinocricus* sp., ♂ from Suva. 75 — habitus, lateral view; 76, 77 — anterior part of body, lateral and ventral views, respectively; 78, 79 — midbody segments, lateral and dorsal views, respectively; 80 — posterior part of body, lateral view. Pictures by K.V. Makarov, taken not to scale.

Рис. 75–80. *Eurhinocricus* sp., ♂ из города Сува. 75 — общий вид, сбоку; 76, 77 — передняя часть тела, соответственно сбоку и снизу; 78, 79 — средняя часть тела, соответственно сбоку и сверху; 80 — задняя часть тела, сбоку. Фотографии К.В. Макарова, сняты без масштаба.

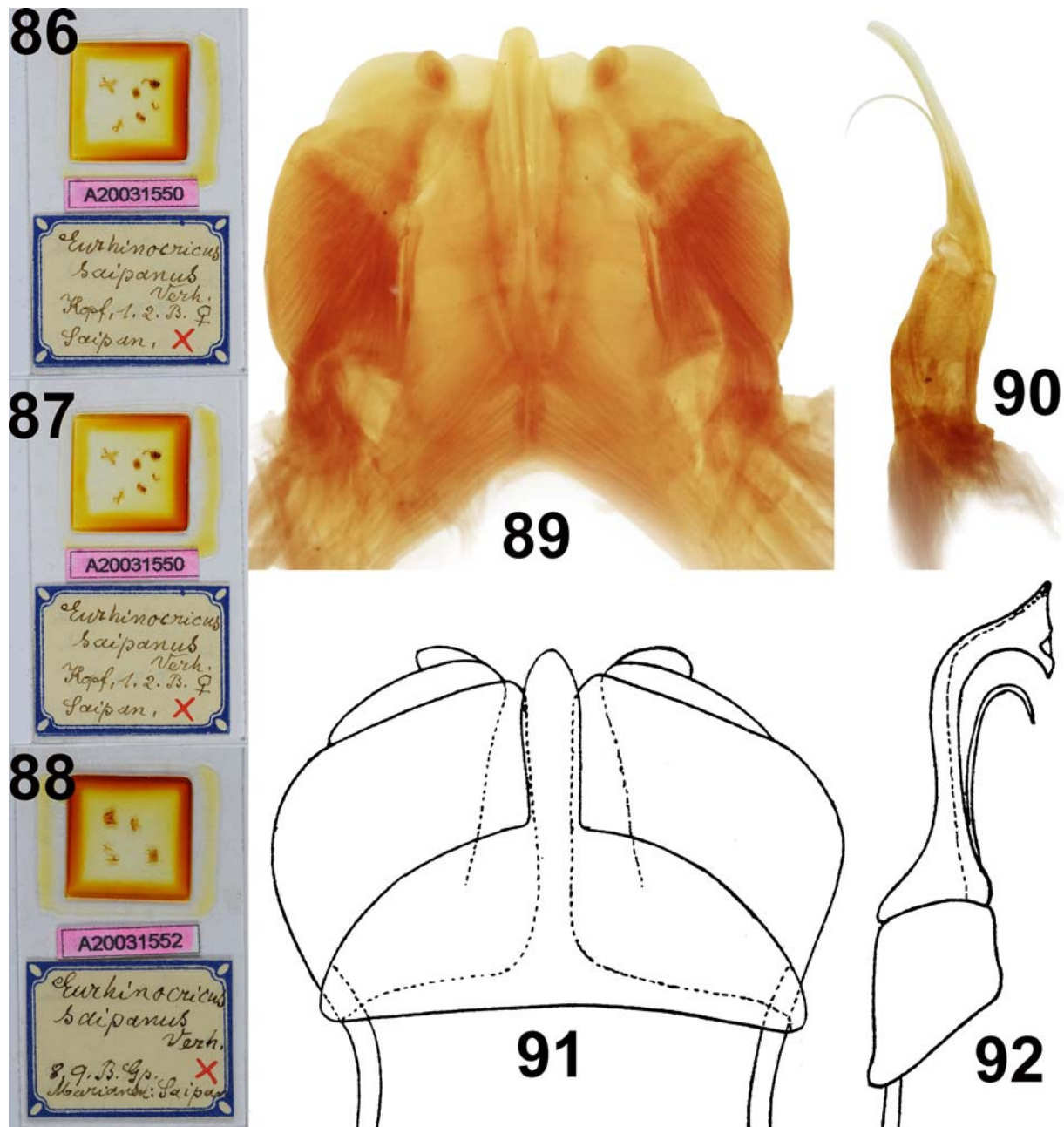
is a little larger (28–33 mm long and 3.5 mm wide, vs. 18–25 mm and 1.9–2.4 mm wide), shows considerably finer striations on meso- and metazonae (vs. far more strongly developed ones, Figs 75–80), the central sternal process of its anterior gonopods is parallel-sided (vs. broader at base, Figs 81–84), the telopodites are smaller (vs. larger), while the solenomere of the posterior gonopod is distinctly longer, nearly reaching the tip of the main branch (vs. considerably shorter, Figs 81, 82, 85) [Carl, 1918]; *E. saipanus* Verhoeff, 1937, from Saipan (= Guam), Marianas, so far as it can be derived from a very brief (and only verbal) original description [Verhoeff, 1937], as well as based on type microscopic slides, shows a stronger, central, sternal process and unusu-

ally short telopodites of the anterior gonopods (vs. weaker and longer, respectively, Figs 81–84), while the main branch of the posterior gonopod is much more slender, suberect and truncate apically (vs. broader, curved subapically and subtruncate, Figs 81, 82, 85). The type material of *E. saipanus*, in the Zoological Museum in Munich (= Bayerische Zoologische Staatssammlung in München), contains one ♂ and one ♀, both partly in alcohol (ZSMA20070540) and partly in microscopic slides A20031550, A20031551 and A20031552 (Figs 86–88), of which A20031551 and A20031552 are designated herewith as representing the lectotype to ensure that the species is based on ♂ material. The gonopods of the lectotype (Figs 89, 90) agree not only with



Figs 81–85. *Eurhinocricus* sp., ♂ from Suva. 81, 82 — both anterior gonopods and left posterior gonopod *in situ*, anterior and posterior views, respectively; 83, 84 — anterior gonopods, anterior and posterior views, respectively; 85 — right posterior gonopod, posterior view. Designations explained in text. Pictures by K.V. Makarov, taken not to scale.

Рис. 81–85. *Eurhinocricus* sp., ♂ из города Сува. 81, 82 — оба передних гонопода, соответственно спереди и сзади; 83, 84 — передние гоноподы, соответственно спереди и сзади; 85 — правый задний гонопод, сзади. Объяснения обозначений в тексте. Фотографии К.В. Макарова, сняты без масштаба.

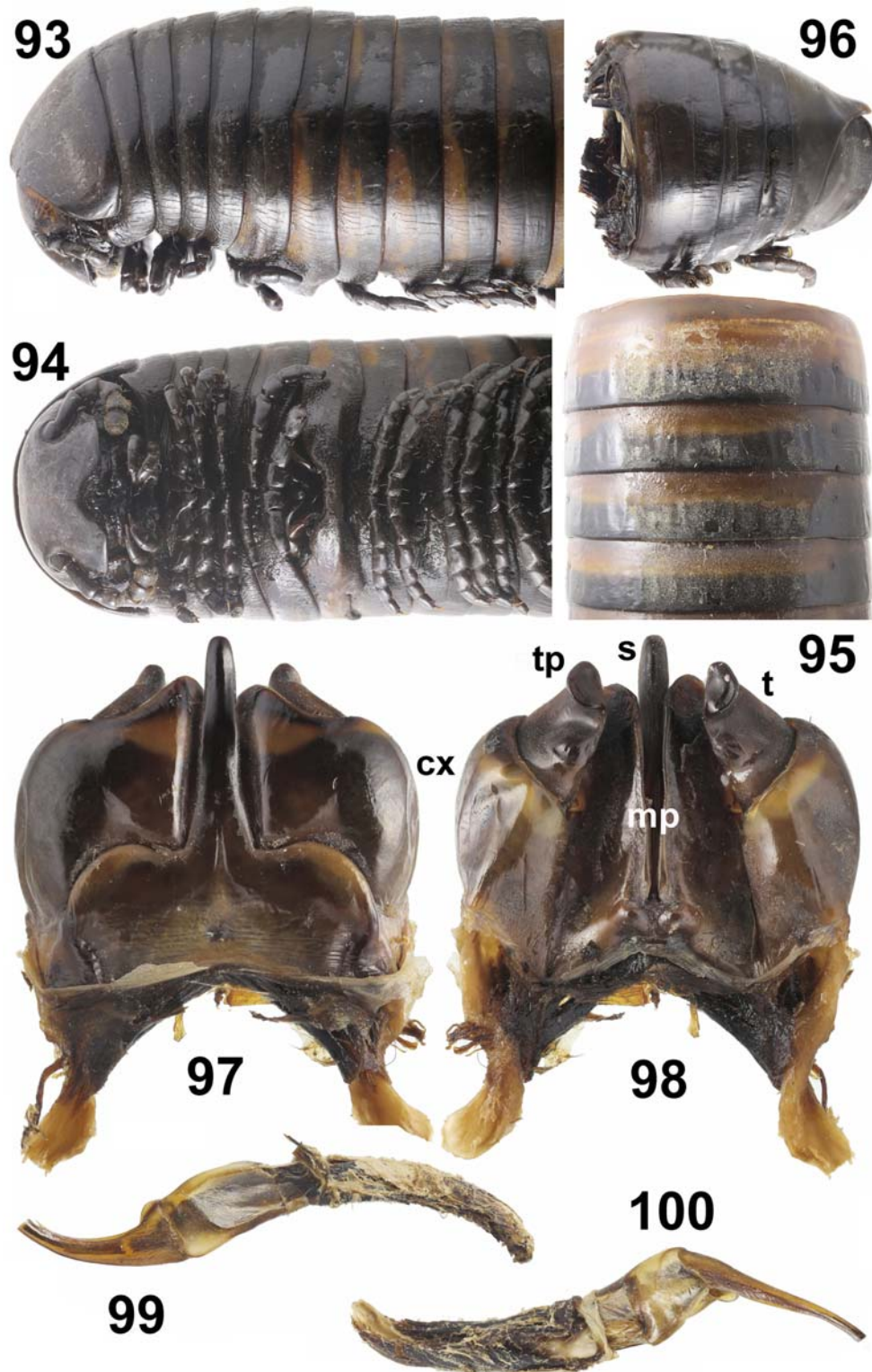


Figs 86–92. *Eurhinocriscus saipanus* Verhoeff, 1937, type microscopic slides, including the gonopods of the lectotype, from Saipan, (= Guam), Marianas, and *Eurhinocriscus* sp., ♂ from Yap Islands, Carolines, after Takakuwa [1942].

Рис. 86–92. *Eurhinocriscus saipanus* Verhoeff, 1937, типовые микропрепараты, включая гоноподы лектотипа, с острова Сайпан (= Гуам), Марианские острова, и *Eurhinocriscus* sp., ♂ с островов Яп, Каролинские острова, по: Takakuwa [1942].

Verhoeff's [1937] brief account, which is natural, but also considerably with what Takakuwa [1942], in his review of the myriapod fauna of Micronesia, referred to as *Eurhinocriscus* sp., from Yap Islands, Carolines. Takakuwa [1942] totally omitted *E. saipanus*, apparently being unaware of it, but he described and illustrated his closer unidentified *Eurhinocriscus* sp. as being 35 mm long and 3.5 mm wide, and generally rather well agreeing in gonopodal characters to *E. saipanus* (Figs 89, 90). Especially the anterior gonopods are similar, including the unusually short telopodites. Still the Yap (Figs 91, 92) and Saipan (Figs 89, 90) sam-

ples fail to look conspecific because the main branch of the posterior gonopod in the former species is much more strongly expanded and elaborate distally compared to the latter one. In any event, more comparative material is clearly necessary to assess the *Eurhinocriscus* diversity in Micronesia and Melanesia. At the moment, all we can state is that Micronesia supports 2–3 species of *Eurhinocriscus*. Strangely enough, Marek *et al.* [2003], in their global catalogue of Rhinocricidae, also omitted *E. saipanus*, even though Jeekel's [2001] regional catalogue had provided a full account of that species.



Figs 93–100. *Salpidobolus alokistus* (Attems, 1914), ♂ near-topotype from Lae. 93, 94 — anterior part of body, lateral and ventral views, respectively; 95 — midbody segments, dorsal view; 96 — posterior part of body, lateral view; 97, 98 — anterior gonopods, anterior and posterior views, respectively; 99, 100 — left posterior gonopod (tip of *lb* branch broken off), posterior and posterolateral views, respectively. Pictures by K.V. Makarov, taken not to scale.

Рис. 93–100. *Salpidobolus alokistus* (Attems, 1914), ♂ почти топотип из порта Lae. 93, 94 — передняя часть тела, соответственно сбоку и снизу; 95 — среднетуловищные сегменты, сверху; 96 — задняя часть тела, сбоку; 97, 98 — передние гоноподы, соответственно спереди и сзади; 99, 100 — левый задний гонопод (кончик ветви *lb* обломан), соответственно сзади и одновременно сбоку. Фотографии К.В. Макарова, сняты без масштаба.

Because the Fiji Islands support a wealth of rhinocricid species, mostly quite enigmatic and some even based on ♀ material alone, whereas the ZMUM samples come from a botanical garden, hence perhaps introduced, falling in synonymy seems to us very likely. As a result, we properly document and illustrate the ZMUM material even as not fully identified, in the hope that someday the taxonomic mess concerning the fauna of Fiji steps back, and the species becomes properly determined. Our Fiji samples are easily distinguished primarily in the body striations being unusually distinct and dense, covering the entire circumference of the meso- and metazonae (Figs 75, 76, 78–80), while the gonopods are also highly characteristic (Figs 81–85).

Jeekel [2001] provided a catalogue that contained as many as 24 species of Rhinocricidae known to occur in Fiji alone, most of which he assigned to *Dinematocricus*. Such an allocation was specially emphasized, and it was based on Jeekel's vast personal experience in the study of Fiji's rhinocricids, who found them all being tetraconocerate. In contrast, Evenhuis [2008], (<http://hbs.bishopmuseum.org/Fiji/checklists/diplopoda.html>), listed most in *Salpidobolus*, a polyconocerate genus. We prefer to follow Jeekel's [2001] opinion as obviously more credible. Because at least five species described from Fiji are listed among Rhinocricidae, Spirobolida or even Juliformia of uncertain status [Jeekel, 2001], the only thing we believe appropriate at this stage is just to publish the first formal record of the genus *Eurhinocricus* from Fiji.

Genus *Salpidobolus* Silvestri, 1897

Type species: *Rhinocricus meyeri* Silvestri, 1897, by original designation.

COMMENT. This large genus of Rhinocricidae presently comprises 30 Australasian species or subspecies ranging from Borneo and Sulawesi in the west, Micronesia and Melanesia in the north, to eastern Papua New Guinea in the east [Jeekel, 2001]. Following Attems [1914] and, especially, Jeekel [2001], this genus is polyconocerate, being distinguished only through the numerous (more than the minimum number of four) apical sensory cones on each antenna. This sole distinction between *Dinematocricus* and *Salpidobolus* is so weak that Hoffman [1974] formally synonymized the former genus under the latter one. In addition, some species were first described in *Dinematocricus* and only later transferred to *Salpidobolus*.

Still we strictly follow Jeekel's [2001] classification for consistency reasons alone.

Salpidobolus alokistus (Attems, 1914)

Figs 93–101.

Polyconoceras alokistus Attems, 1914: 312, original description from a ♂ and a ♀ syntype from near Cape Arkona, Huon Gulf, Papua New Guinea.

Salpidobolus alokistus — Jeekel, 2001: 33.

MATERIAL. 1 ♂ (ZMUM), Papua New Guinea, S6°44'0", E147°0'0", Port Lae, botanical garden, wet forest, 18.II.1977, G.F. Kurcheva leg.

BRIEF REDESCRIPTION. Length ca. 160 mm, width 14.5 mm, with 55+T segments. Colouration blackish grey-brown with olive tinge, pattern clearly cingulated due to particularly dark metazonae and lighter, mostly brown pro- and mesozonae; tip of epiproct and legs dark brown (Figs 93–96).

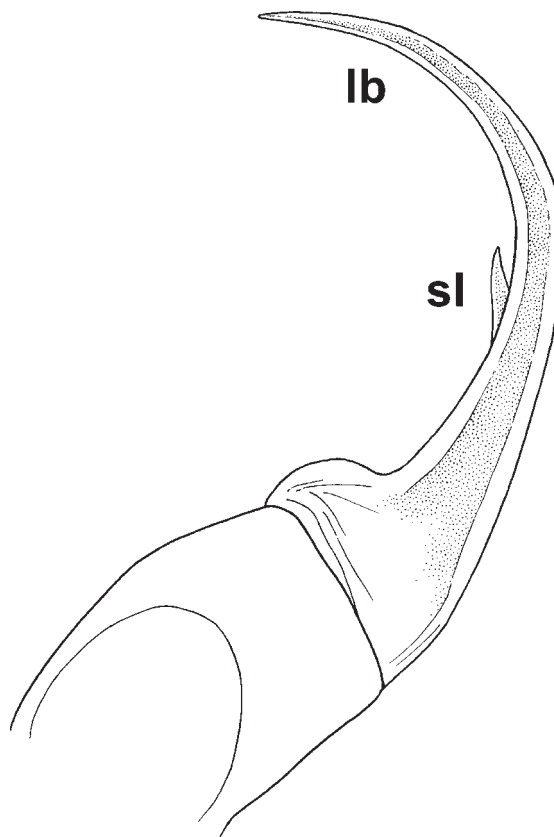


Fig. 101. Right posterior gonopod of *Salpidobolus alokistus* (Attems, 1914), ♂ near-topotype from Port Lae, anterior view. Designations explained in text. Drawn not to scale.

Рис. 101. Правый задний гонопод *Salpidobolus alokistus* (Attems, 1914), ♂ почти топотип из порта Лае, спереди. Объяснения обозначений в тексте. Нарисовано без масштаба.

All characters as in *Propodobolus* sp., except as follows.

Tegument smooth and shining, mostly very delicately vermiculate. Antennae with numerous, small, apical cones; antennomeres 5–7 densely setose, 4th with several setae only near apical end; in length, $2 > 3 > 4 = 5 = 6 > 1 > 7$. Interantennal isthmus ca. 3x diameter of antennal socket. Collum broadly and regularly rounded laterally, only anterolateral margin rather briefly, narrowly and faintly bordered, but caudolateral corner clearly swollen, drop-shaped and rounded. Midbody segments/rings faintly striate to striolate, more densely and clearly so ventrad, striations often being irregular, on dorsum above ozopore level strongly obliterate, represented by faint, low, longitudinal ribs only on metazonae (Fig. 95). Scobinae absent. Ozopores small, inconspicuous disks, starting with ring 6, each pore lying upon line/suture both just before metazona and longitudinal line. Numerous light and irregular spots/sigilla on internal surface of meso- and metazonae. Epiproct flattened dorsoventrally, in lateral view faintly concave at base of a short, but clear apical process. Paraprocts very clearly concave at ca. 1/3 before caudal margin (Fig. 96).

Legs ca. 1/2 as long as body height (♂); sole pads absent. ♂ coxae 3–5 swollen ventrally (Fig. 94), a spine each above and below claw.

Gonopods (Figs 97–101). Anterior gonopods with a strong, very long/high, unusually slender, central, apically

narrowly rounded, sternal process (**s**), the latter being much longer/higher than both coxa (**cx**) and telopodite (**t**) with its small, apical, rounded, caudolateral process (**tp**); **cx** stout, on each side with a moderate, elongate, mesal, rounded projection (**mp**), **t** much more slender than **cx**. Telopodite of posterior gonopods consisting of an unusually short and peg-shaped solenomere (**sl**), and a much longer, regularly curved, apicolateral branch (**lb**) (Fig. 101).

REMARKS. The above sample fits very well the original description [Attems, 1914], including such particular characters as the presence of a short, but distinct, apical epiproct process, the shape of the anterior gonopods, and the unusually short and peg-shaped solenomere of the posterior gonopod.

Two syntypes of *S. alokistus* are housed in the Berlin Museum, both stated to be ♀♀ [Moritz, Fischer, 1975], although Attems [1914] based his original description on a ♂ and a ♀ syntype. The Vienna Museum keeps only a micro preparation (NHMW 4029) containing several ♂ legs, but no gonopods. Because the slide is labeled “*Rhinocricus alokistus* / Bukaua / ö. n. guinea”, the specimen may well be presumed to represent a syntype. Since the above type locality lies just within the settlement of Lae, the new sample may be regarded as a near-typotype.

Conclusion

We hope the present paper will stimulate revisionary work on the numerous enigmatic or still poorly-known types kept at various museums worldwide. Only a careful and meticulous approach can be recommended, especially as regards iconography. Describing further new taxa without proper revision of old data and material is to be strongly discouraged. One of the due efforts is preferably to get the responsible collection keepers involved, as many places are presently supplied with high-quality photographic equipment to obtain good colour images. Molecular research may also join in to seriously assess phylogenetic relationships between the numerous taxa. Cryptic speciation has long been documented in Rhinocricidae, based on both morphological and molecular evidence [Bond, Sierwald, 2003]. Taxonomically, the Rhinocricidae is a real challenge not only because of its remarkable diversity, but also because the family is notable for its reductionist evolutionary trends making any phylogenetic analysis particularly difficult [Pitz, Sierwald, 2010]. Hemianamorphosis may also make things more complicated [Mauriès, 1980; Enghoff *et al.*, 1993; Bond *et al.*, 2003].

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